



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

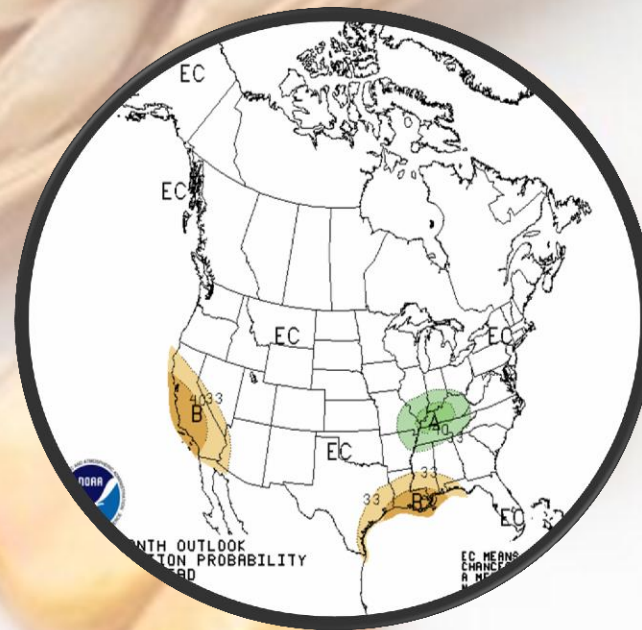
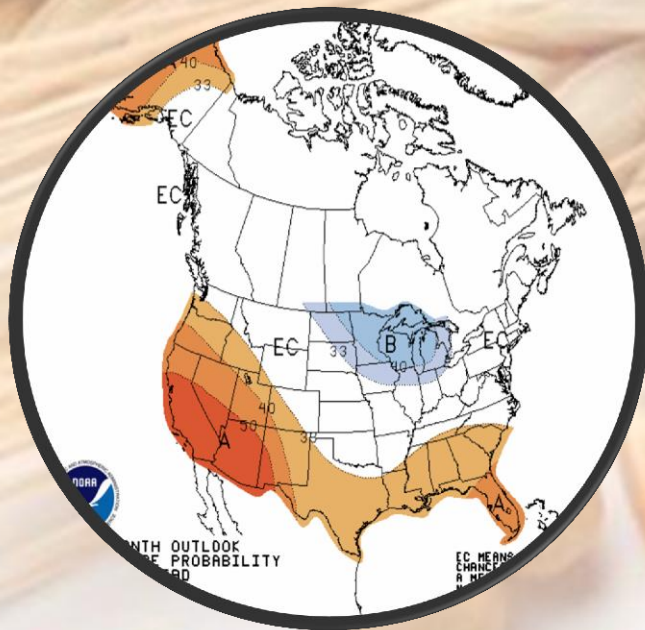
Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

CPC Climate Outlooks For Spring & Summer 2014



Anthony Artusa
Climate Prediction Center
College Park, MD

USDA Agricultural Outlook Forum, Crystal City, VA
2/21/2014





“FLASH DROUGHT” OF 2013

Frozen soils (Upper Midwest) into April

Very wet Spring

Plants developed shallow root systems in response to wetness

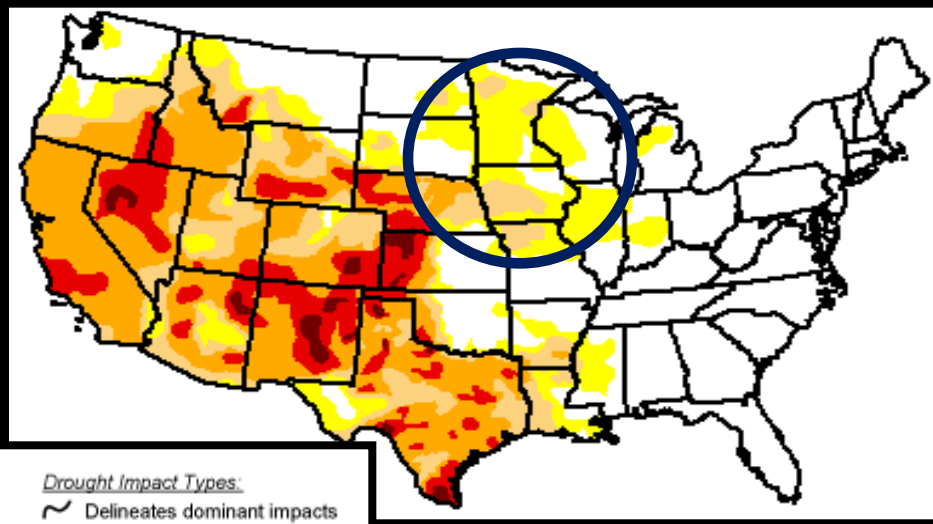
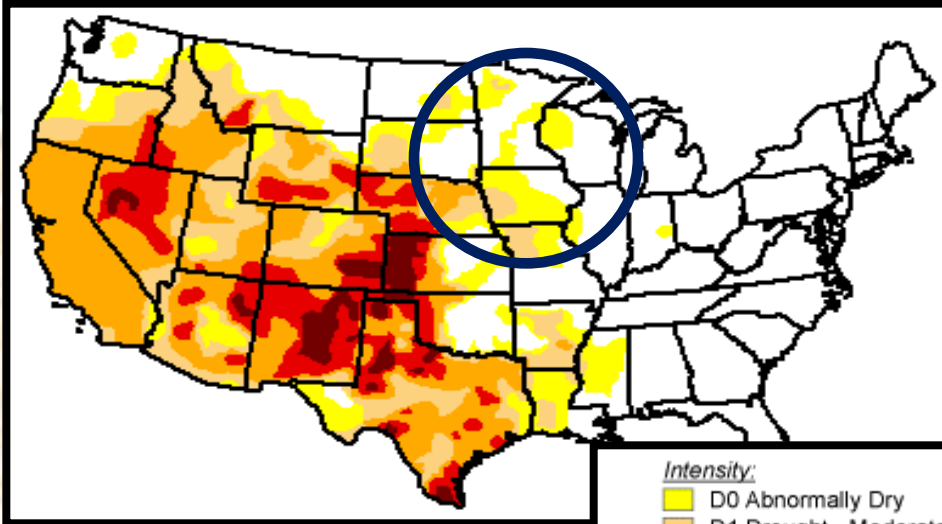
When wetness abruptly stopped in early summer, roots unable to access deeper moisture.

Drought rapidly expands & intensifies

(U.S. Drought Monitor 2013)

August 6

August 20



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

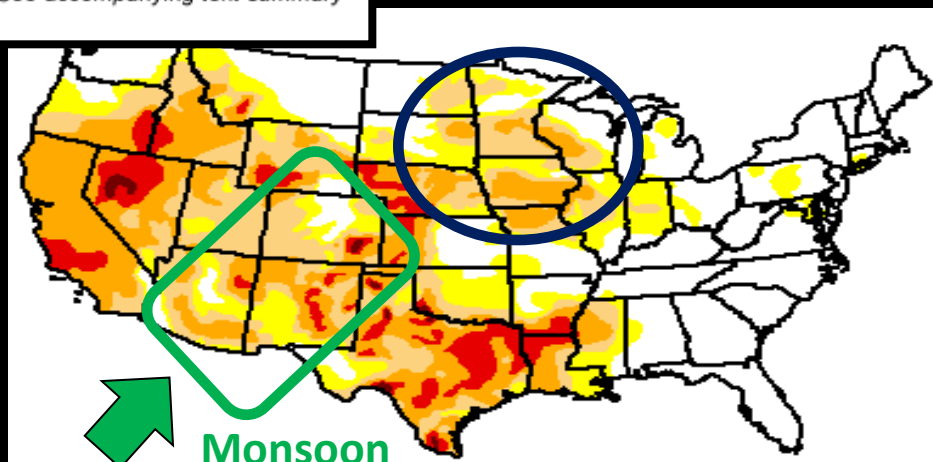
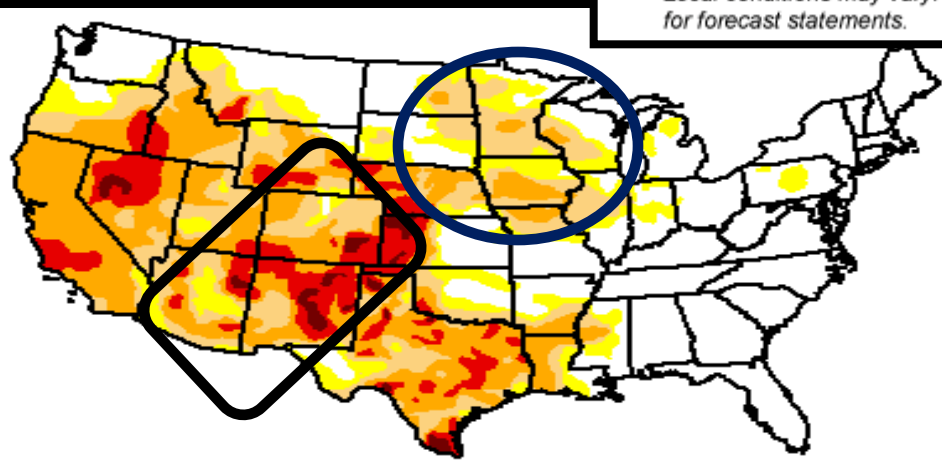
Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)

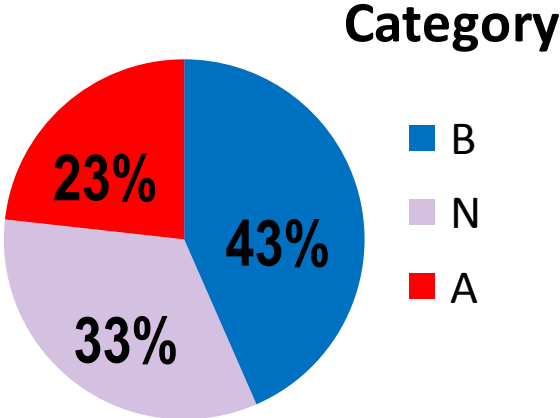
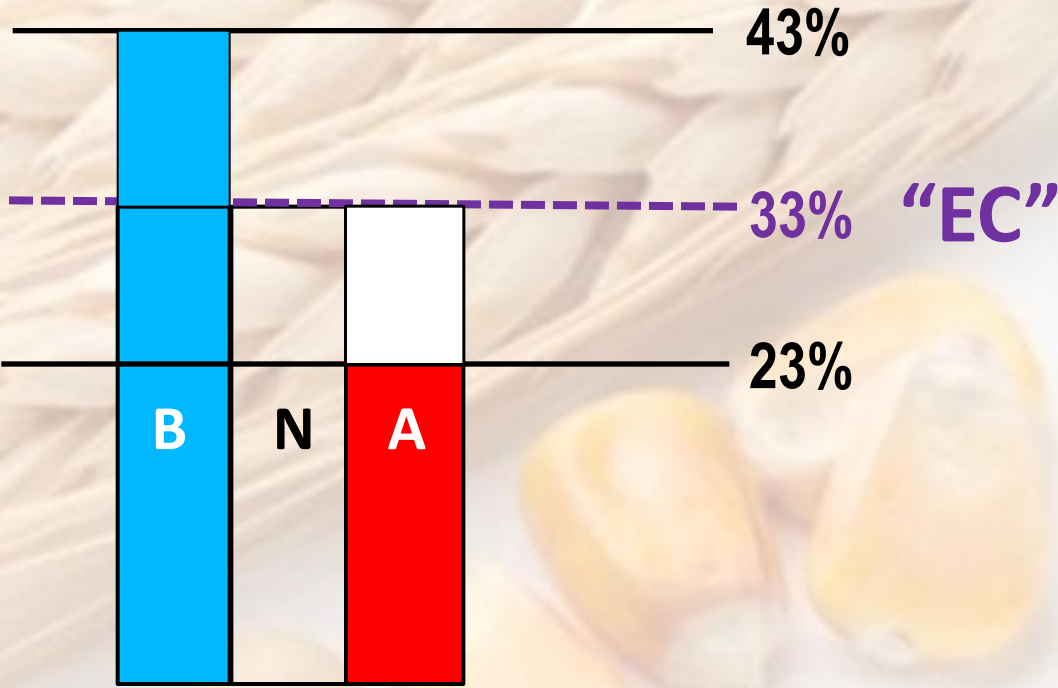
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Sept 3

Sept 17

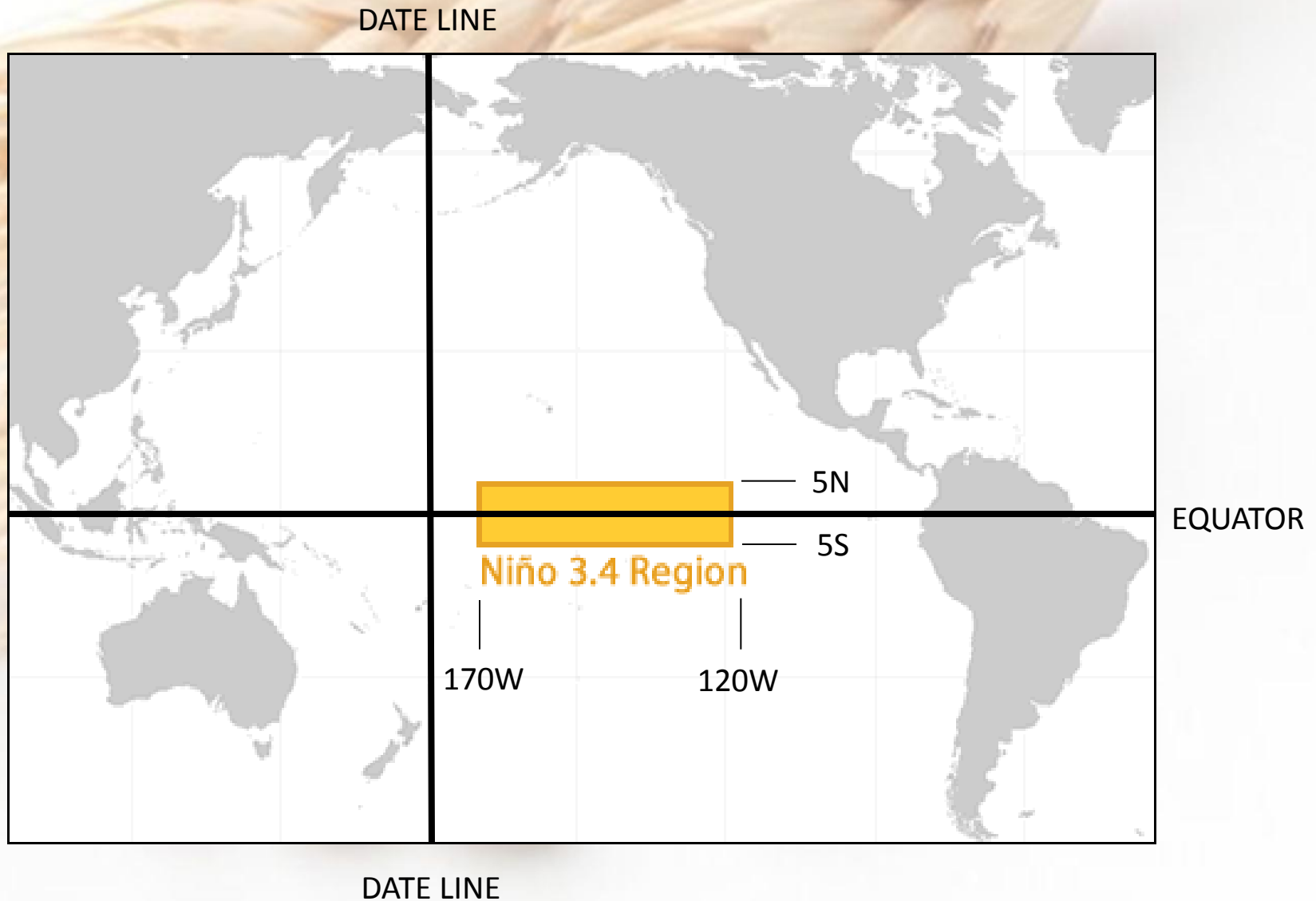


TERCILE ADJUSTMENTS



**MOST
LIKELY
CATEGORY:**
**BELOW
NORMAL**

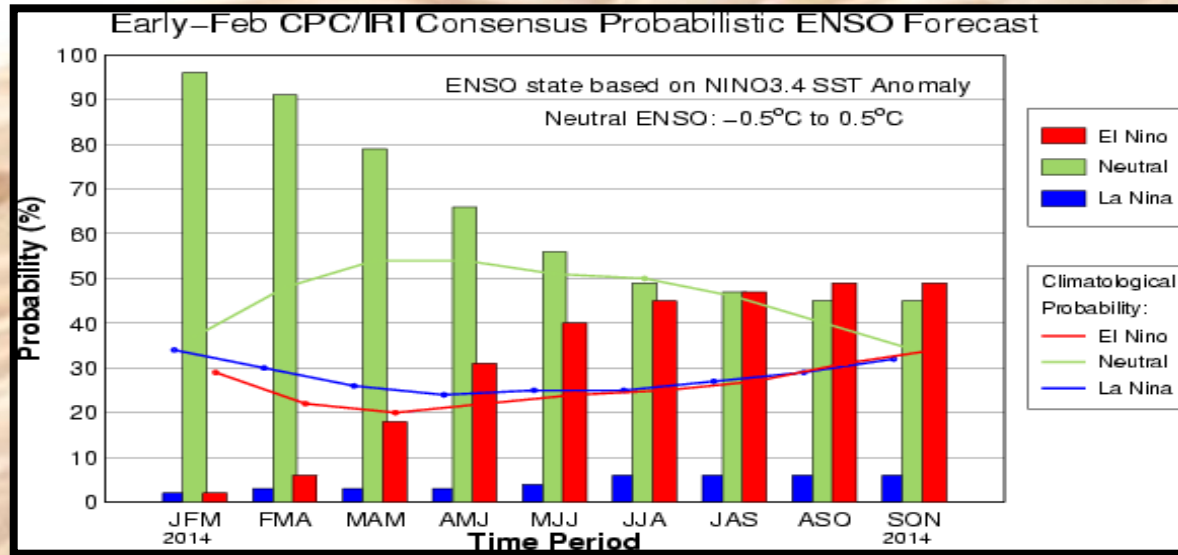
NINO 3.4 REGION



Spring & Summer **2014** Climate Outlooks



ENSO-NEUTRAL FAVORED (SPRING) BORDERLINE NEUTRAL / EL NINO (SUMMER)

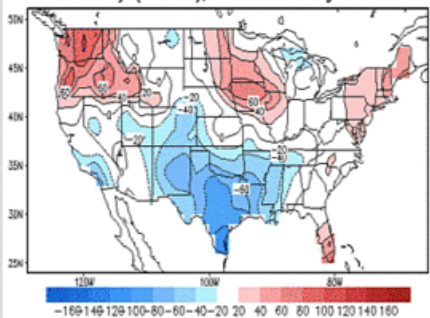


Season	La Niña	Neutral	El Niño
JFM 2014	2%	96%	2%
FMA 2014	3%	91%	6%
MAM 2014	3%	79%	18%
AMJ 2014	3%	66%	31%
MJJ 2014	4%	56%	40%
JJA 2014	6%	49%	45%
JAS 2014	6%	47%	47%
ASO 2014	6%	45%	49%
SON 2014	6%	45%	49%

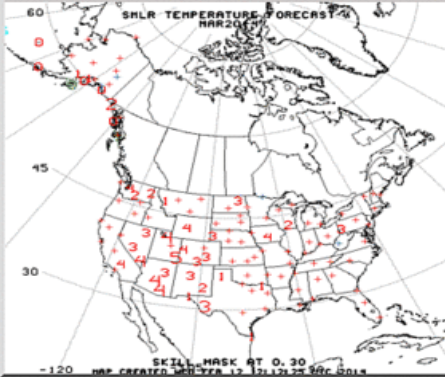
MAR 2014 [Temperature]

CAS

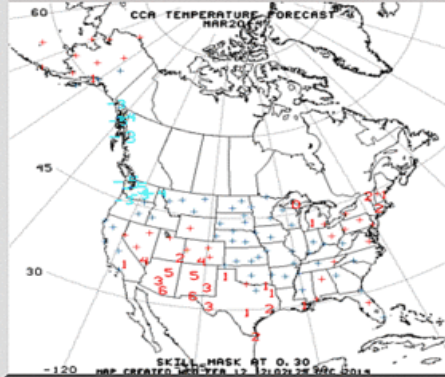
Lagged Averaged Temperature Outlook for MAR 2014
units: anomaly (sdX100), SM data ending at 20140211



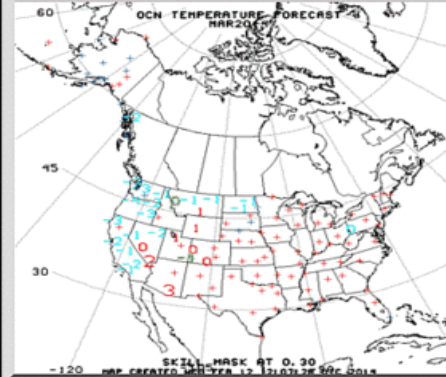
SMLR



CCA

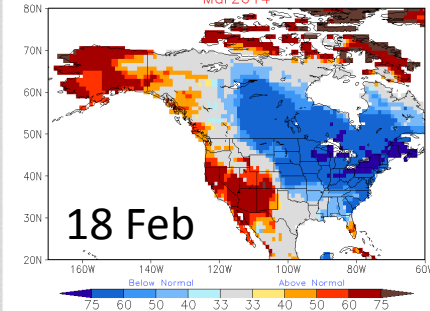


OCN

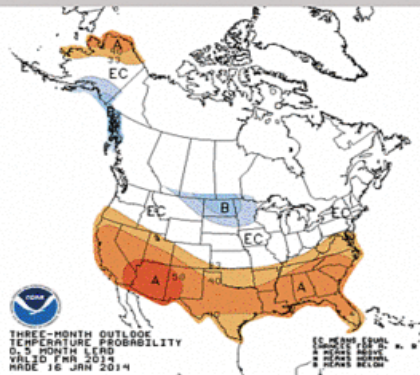


CFSv2 (Probability)

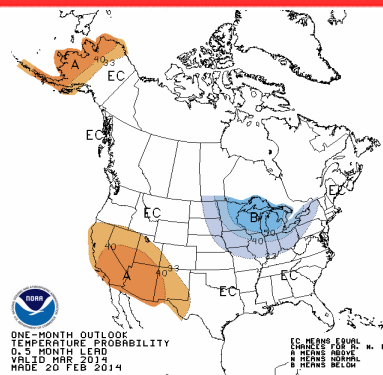
CFSv2 monthly T2m probability forecast
Mar 2014



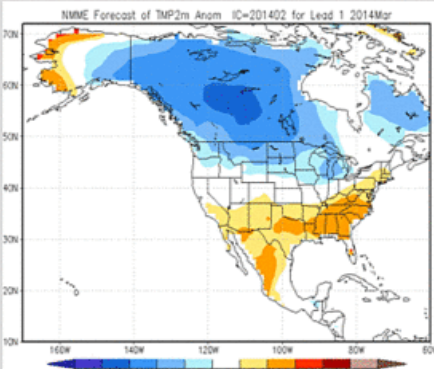
PREV-SNL



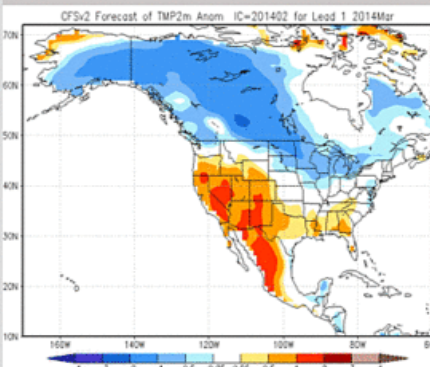
** NEW-OTLK **



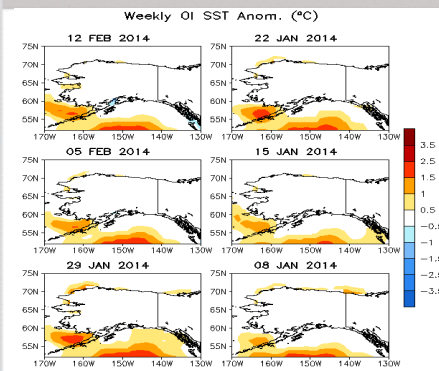
NMME



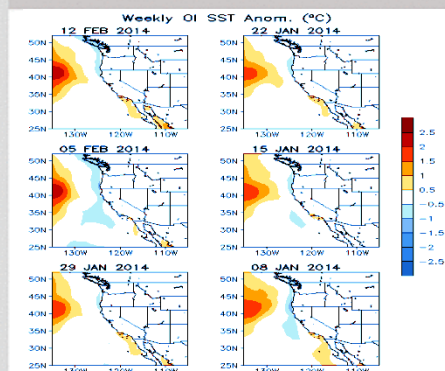
CFSv2 (NMME version)



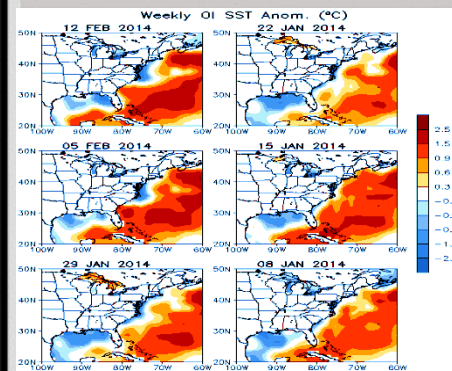
WEEKLY SSTs



WEEKLY SSTs



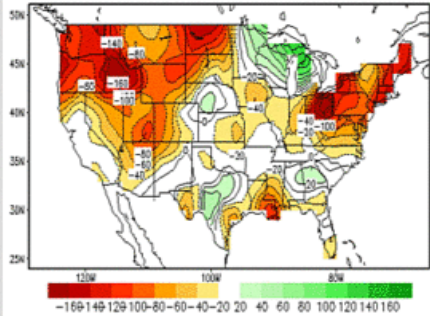
WEEKLY SSTs



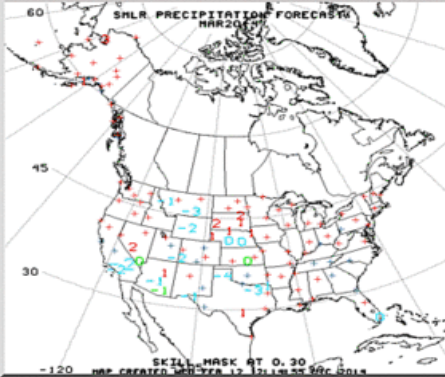
MAR 2014 [Precipitation]

CAS

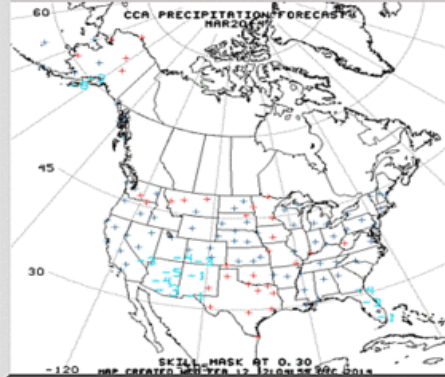
Logged Averaged Precipitation Outlook for MAR 2014
units: anomaly (sdX100), SM data ending at 20140211



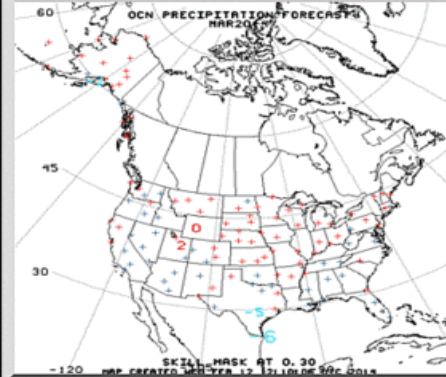
SMLR



CCA

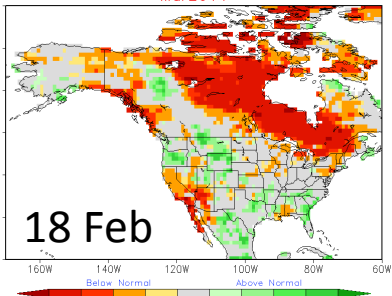


OCN

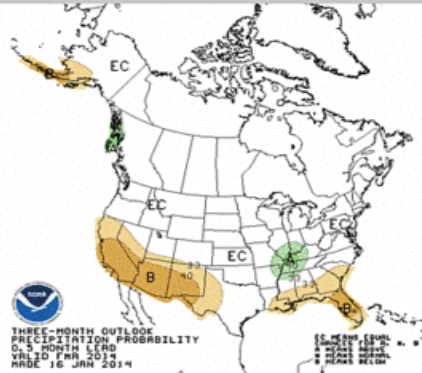


CFSv2 (Probability)

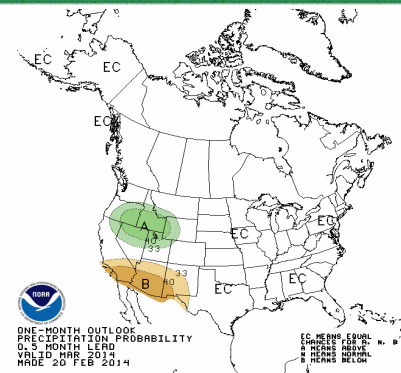
CFSv2 monthly Prec probability forecast
Mar2014



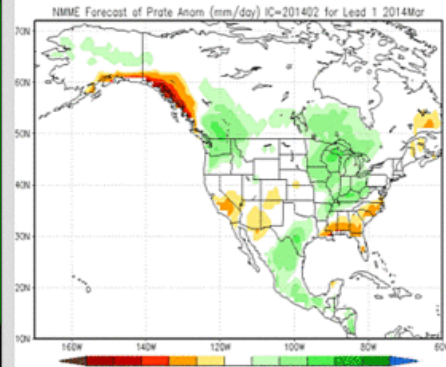
PREV-SNL



** NEW-OTLK **

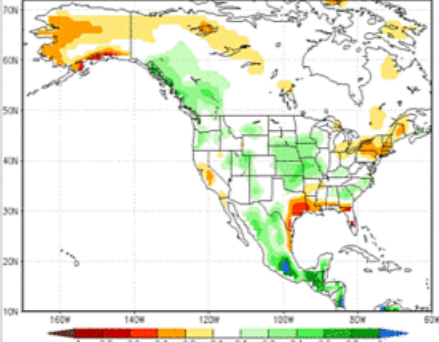


NMME



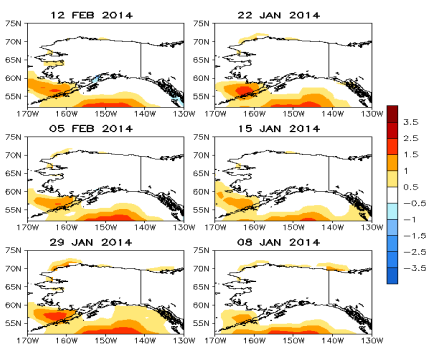
CFSv2 (NMME version)

CFSv2 Forecast of Prate Anom (mm/day) IC-201402 for Lead 1 2014Mar



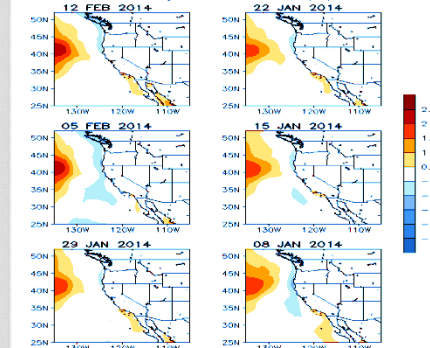
WEEKLY SSTs

Weekly OI SST Anom. (°C)



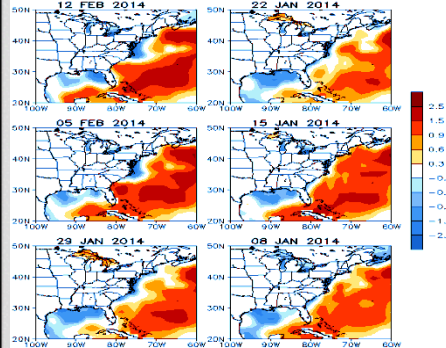
WEEKLY SSTs

Weekly OI SST Anom. (°C)



WEEKLY SSTs

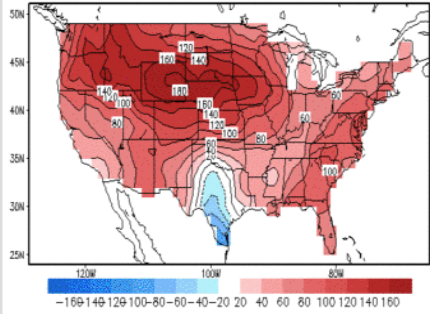
Weekly OI SST Anom. (°C)



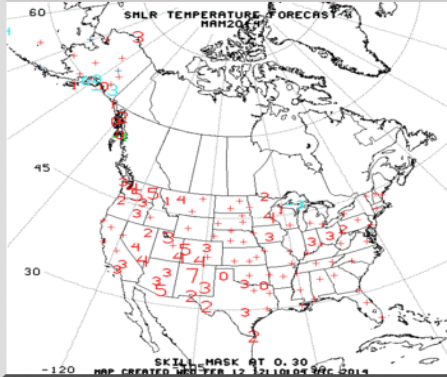
MAM Season [Temperature]

CAS

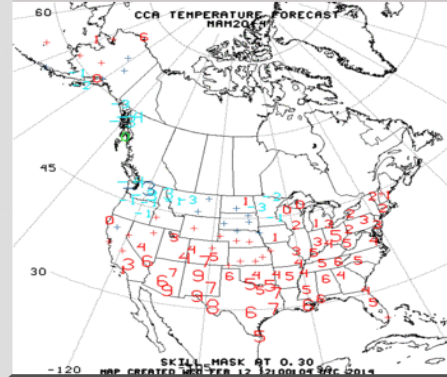
Logged Averaged Temperature Outlook for MAM 2014
units: anomaly (sdX100), SM data ending at 20140211



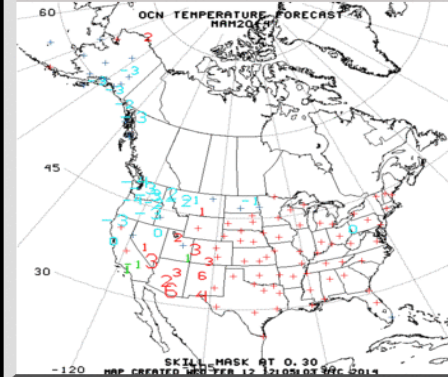
SMLR



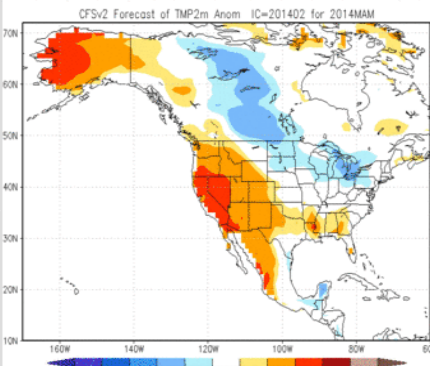
CCA



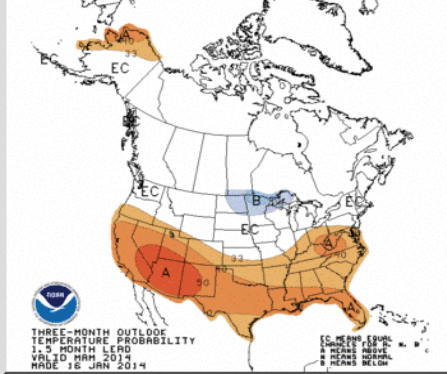
OCN



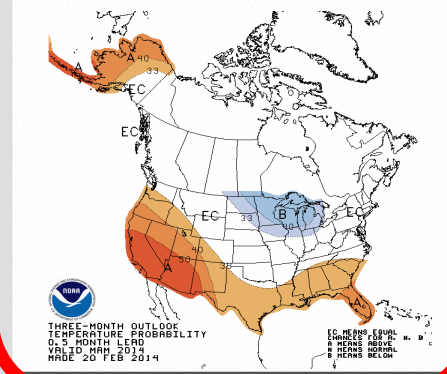
CFSv2



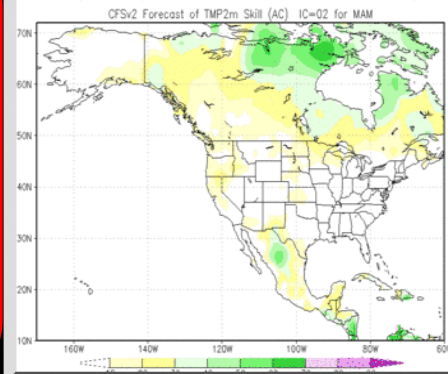
OLD OUTLOOK



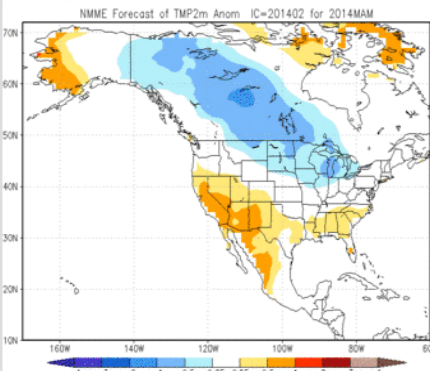
**** NEW OUTLOOK ****



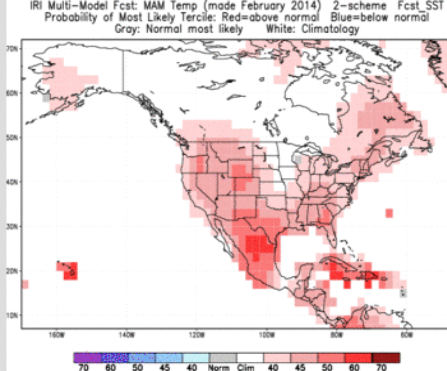
CFSv2 (skill)



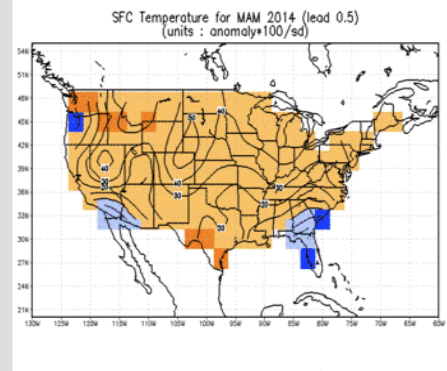
NMME



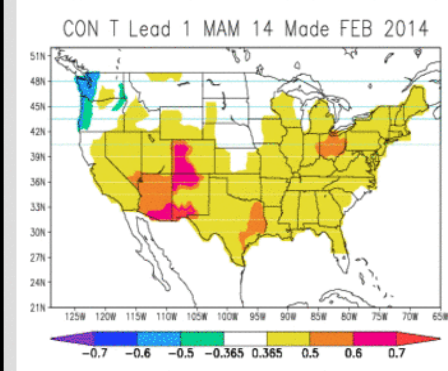
IRI



ENSEMBLE CCA (ECCA)



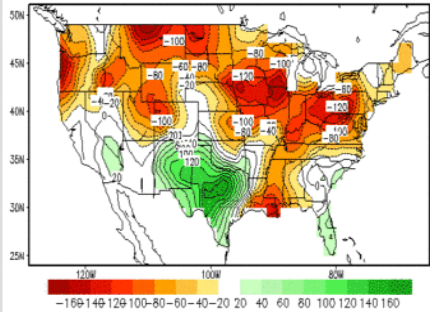
CONSOLIDATION



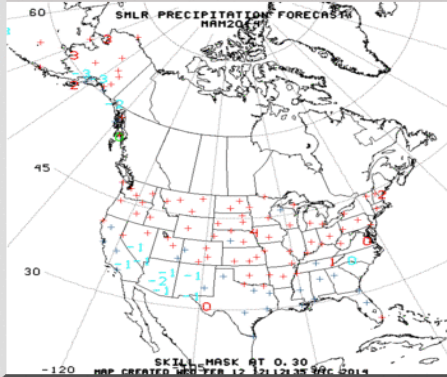
MAM Season [Precipitation]

CAS

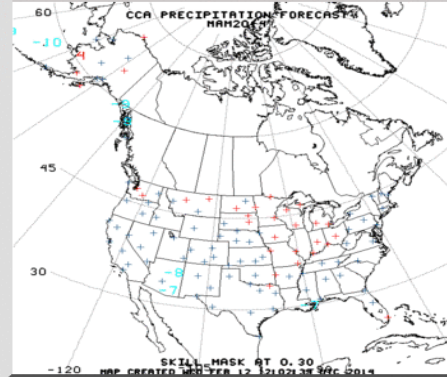
Logged Averaged Precipitation Outlook for MAM 2014
units: anomaly (sdX100), SM data ending at 20140211



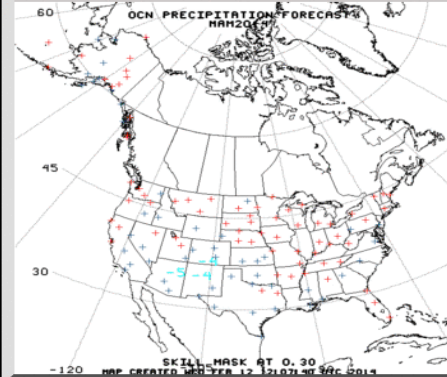
SMLR



CCA

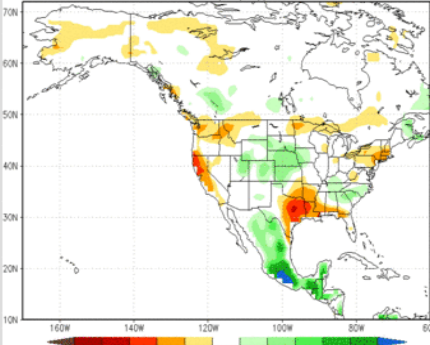


OCN

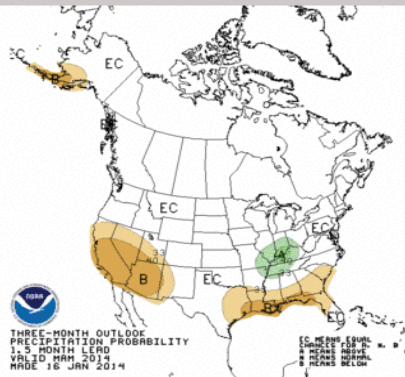


CFSv2

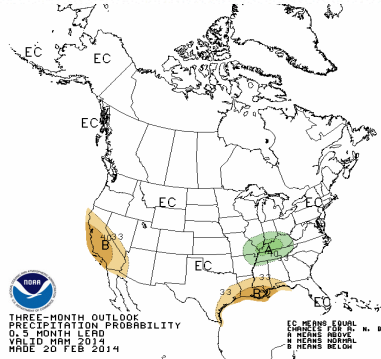
CFSv2 Forecast of Prate Anom (mm/day) IC=201402 for 2014MAM



OLD OUTLOOK

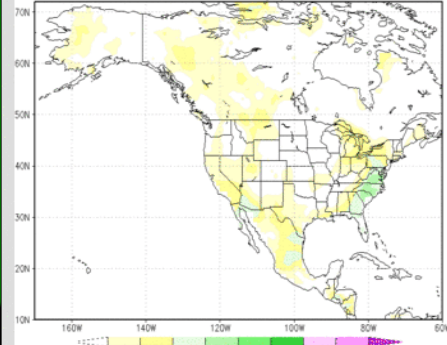


**** NEW OUTLOOK ****



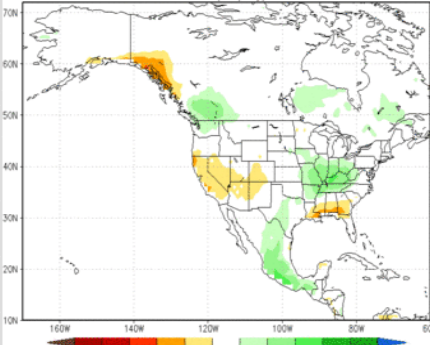
CFSv2 (skill)

CFSv2 Forecast of Prate Skill (AC) IC=02 for MAM



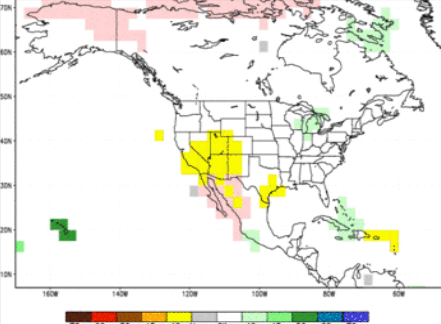
NMME

NMME Forecast of Prate Anom (mm/day) IC=201402 for 2014MAM



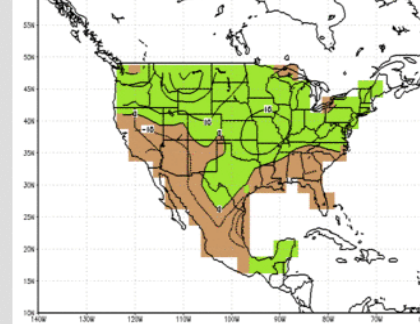
IRI

IRI Multi-Model Fcst: MAM Precip (made February 2014) 2-scheme Fcst_SST
Probability of Most Likely Tercile: Green-above normal Yellow/brown: below normal
Gray: Normal most likely White: Climatology Pink: Dry Season Mask



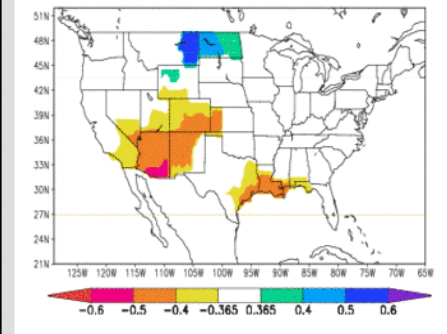
ENSEMBLE CCA (ECCA)

Precip for MAM 2014 (lead 0.5)
units: anomaly*100/sd



CONSOLIDATION

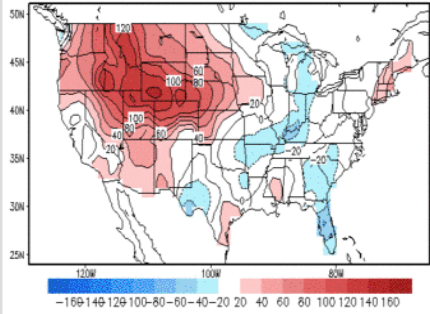
CON P Lead 1 MAM 14 Made FEB 2014



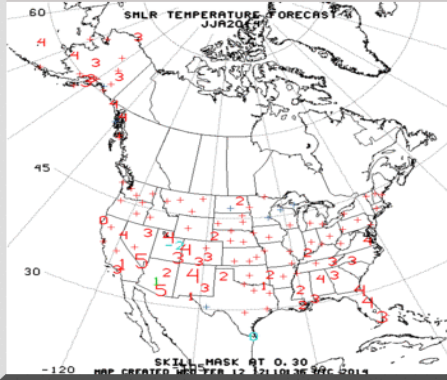
JJA Season [Temperature]

CAS

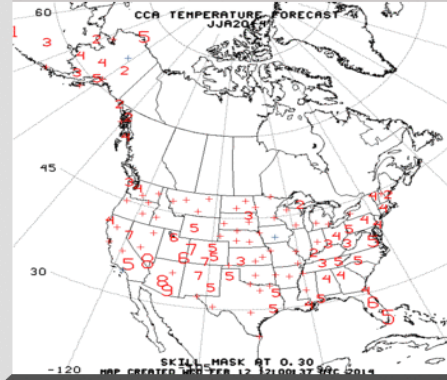
Lagged Averaged Temperature Outlook for JJA 2014
units: anomaly (sdX100), SM data ending at 20140211



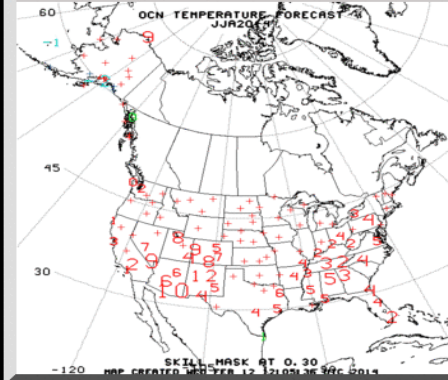
SMLR



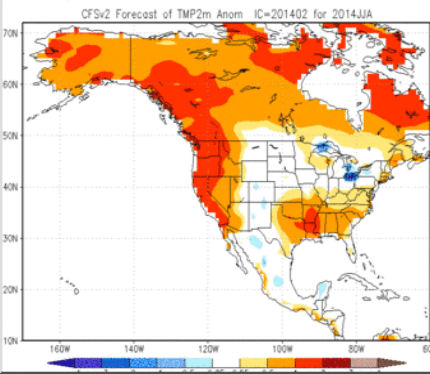
CCA



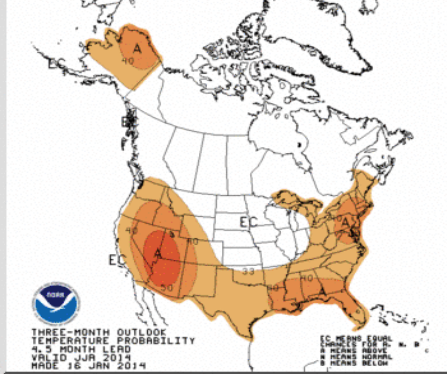
OCN



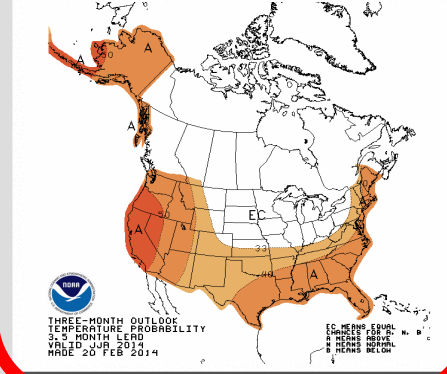
CFSv2



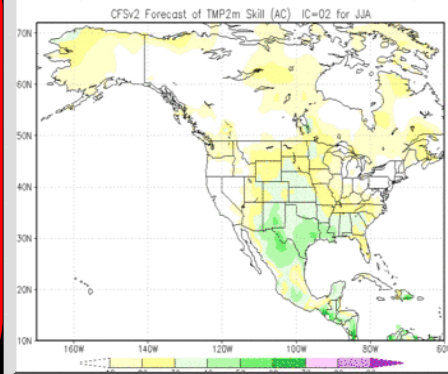
OLD OUTLOOK



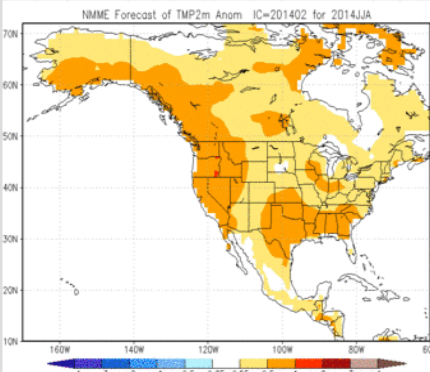
** NEW OUTLOOK **



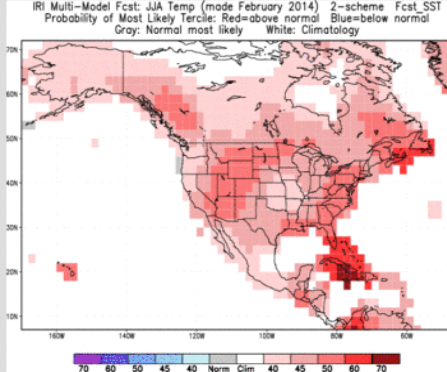
CFSv2 (skill)



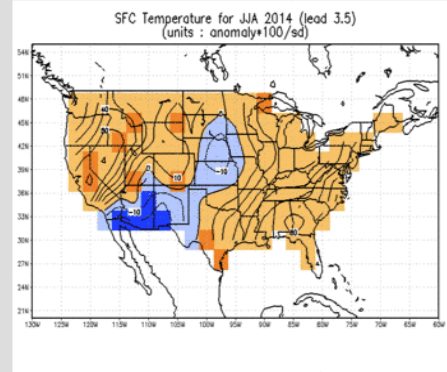
NMME



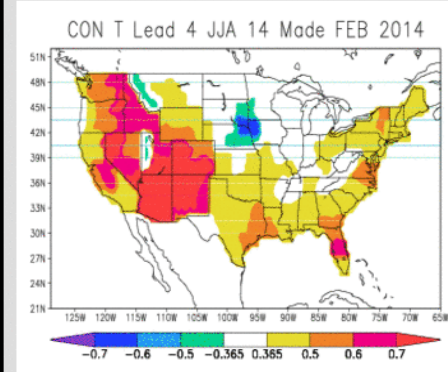
IRI



ENSEMBLE CCA (ECCA)



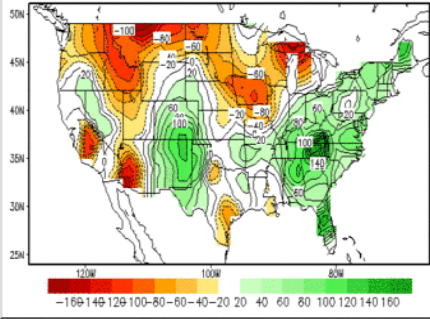
CONSOLIDATION



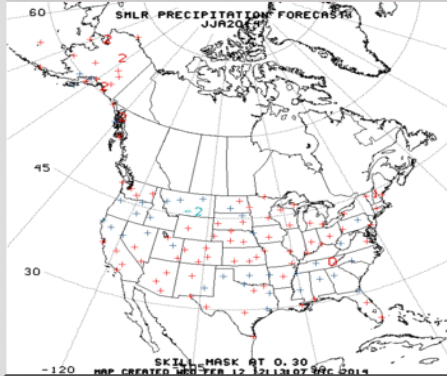
JJA Season [Precipitation]

CAS

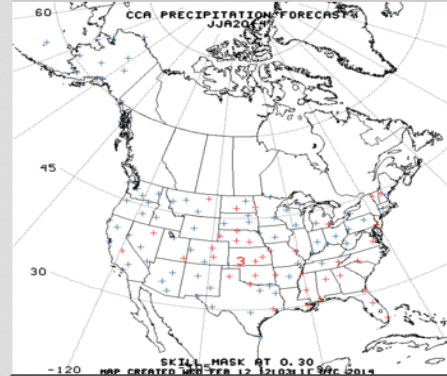
Lagged Averaged Precipitation Outlook for JJA 2014
units: anomaly (sdX100), SM data ending at 20140211



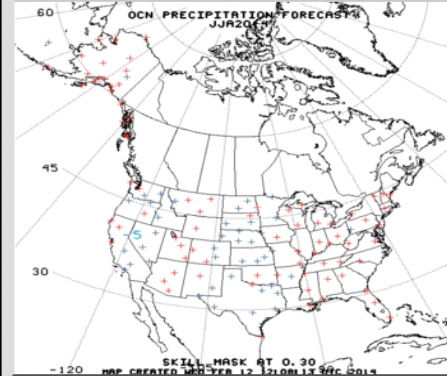
SMLR



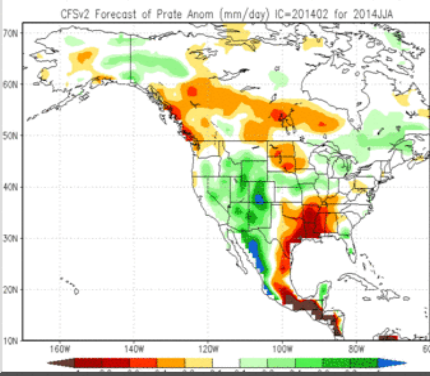
CCA



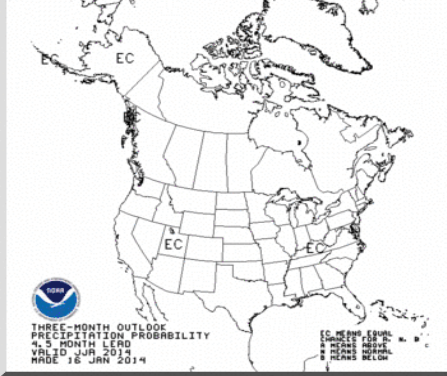
OCN



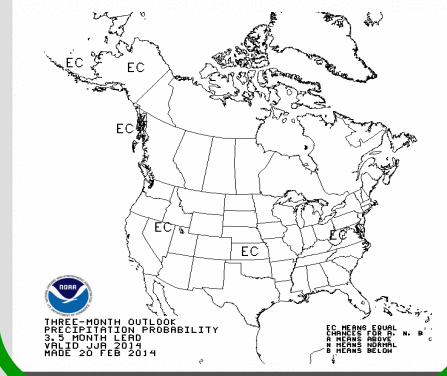
CFSv2



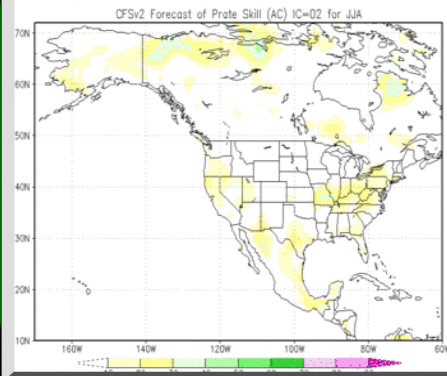
OLD OUTLOOK



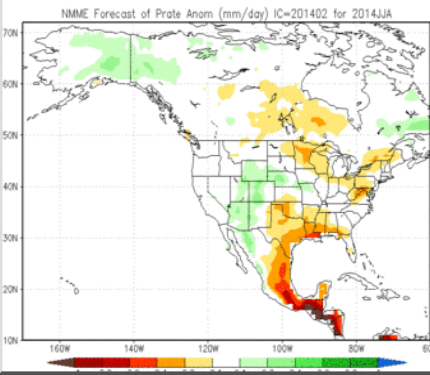
** NEW OUTLOOK **



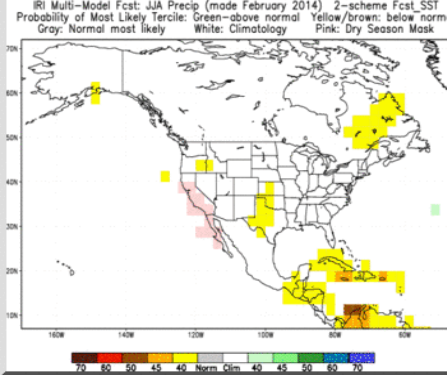
CFSv2 (skill)



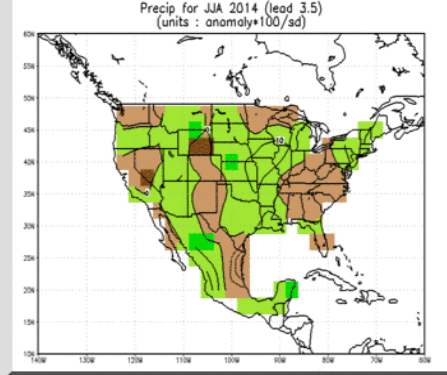
NMME



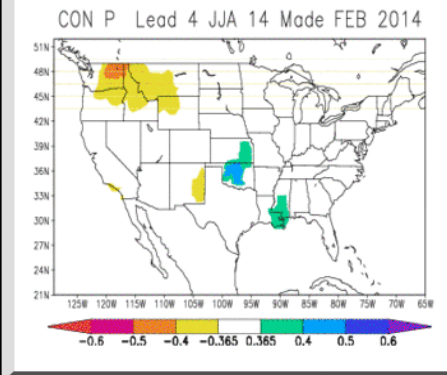
IRI



ENSEMBLE CCA (ECCA)



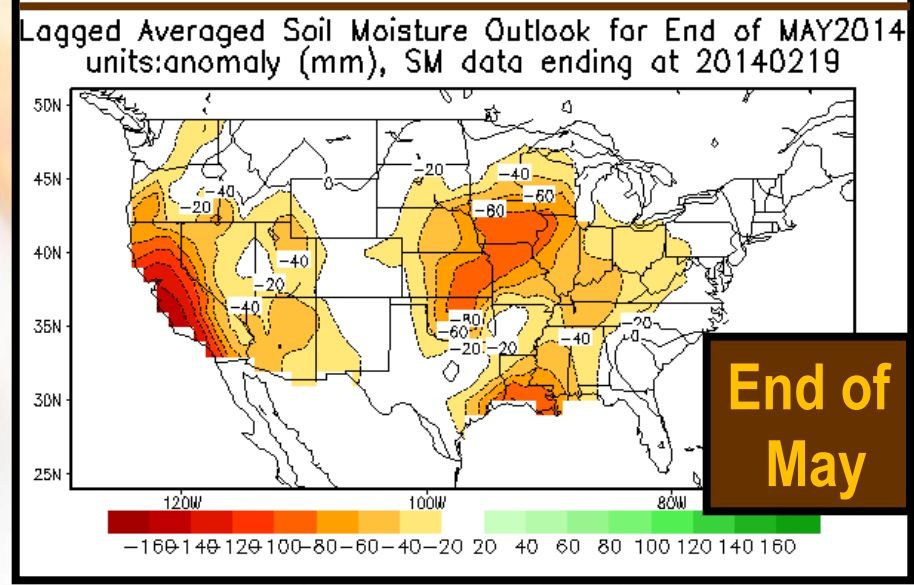
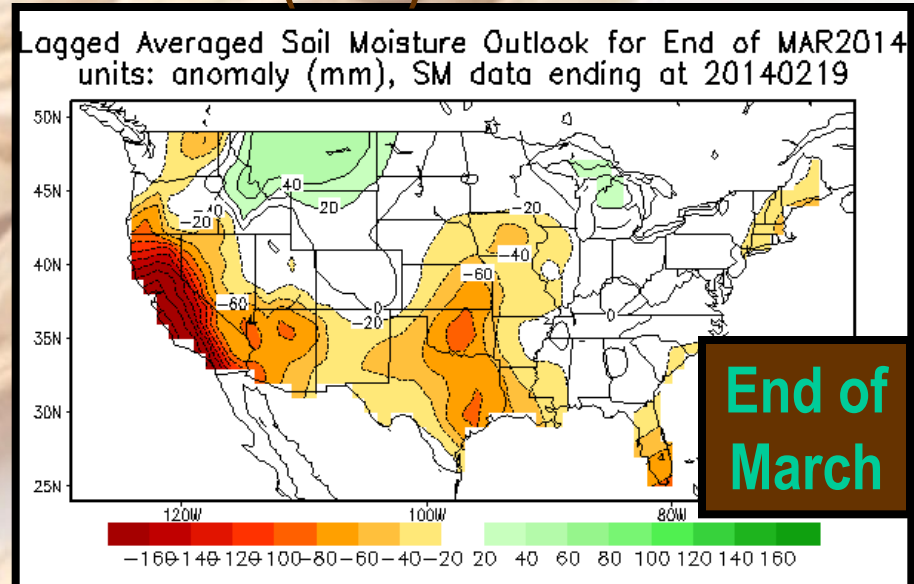
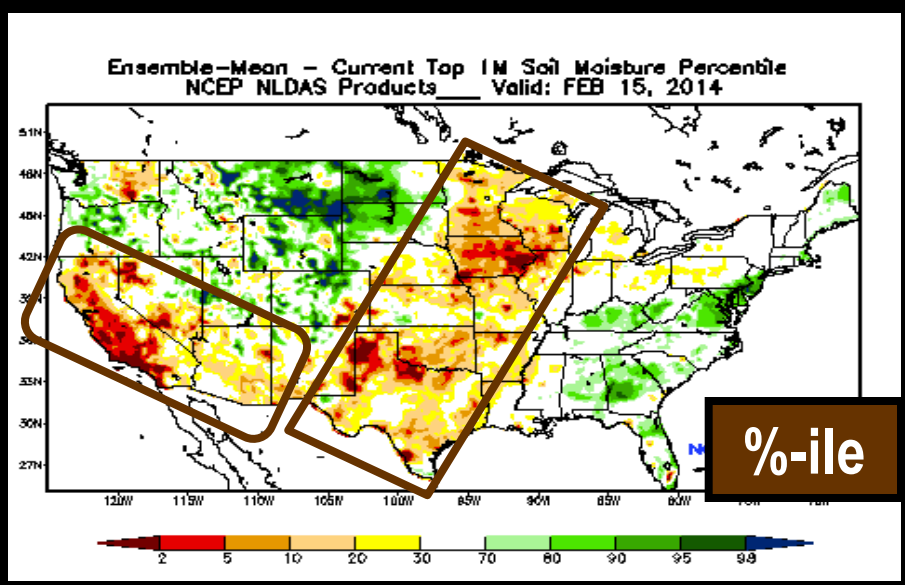
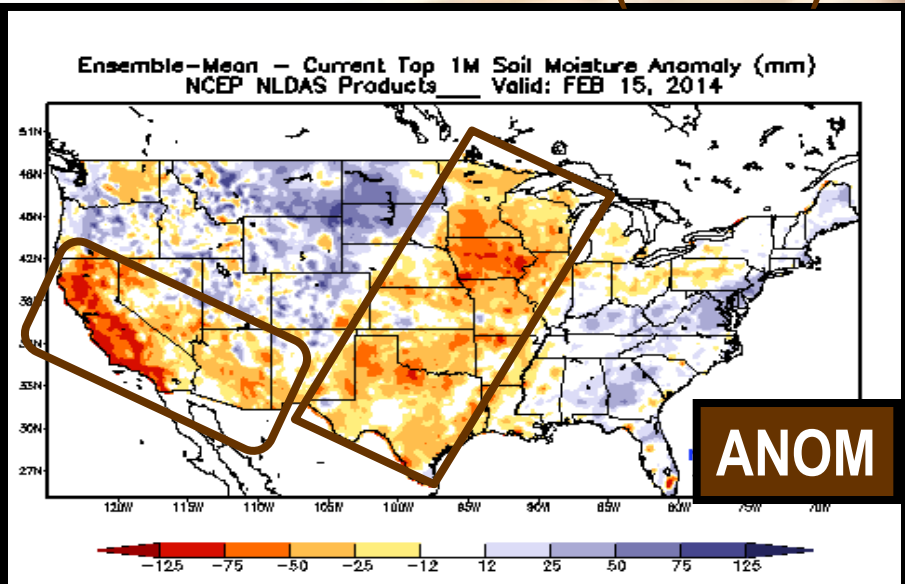
CONSOLIDATION



Soil Moisture

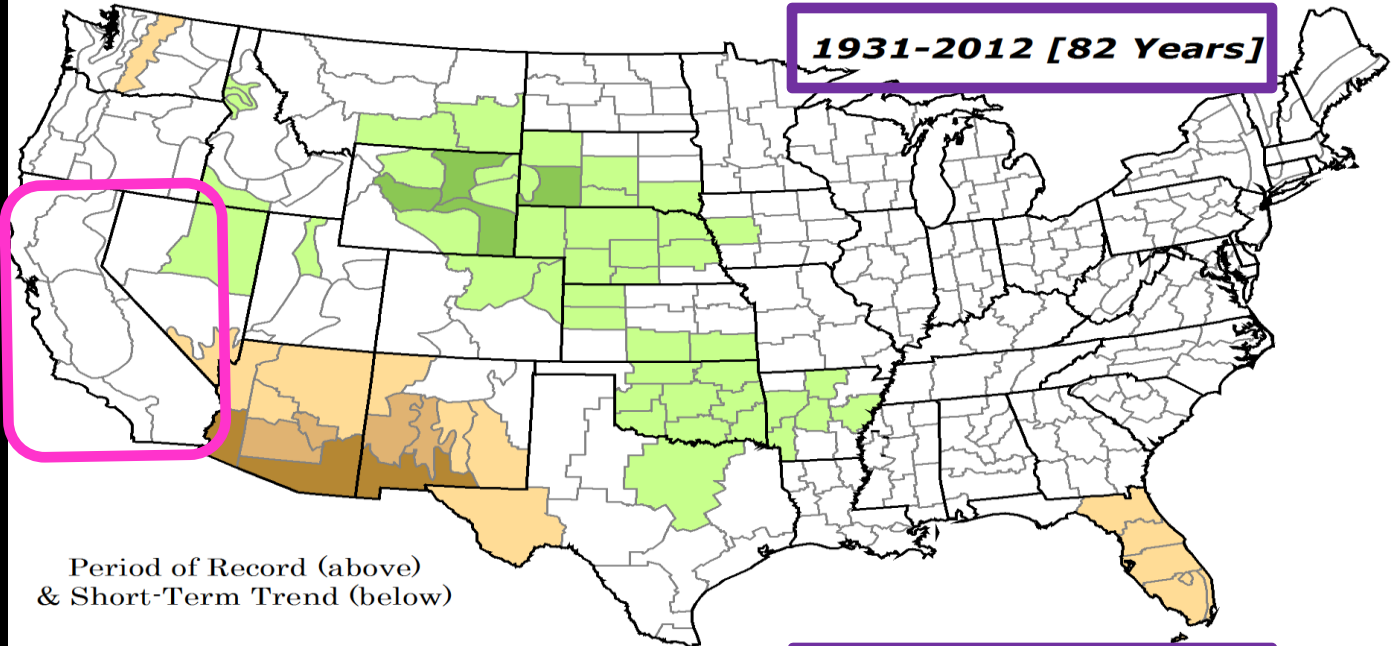
“Current” Conditions (NLDAS)

(CAS) Outlooks



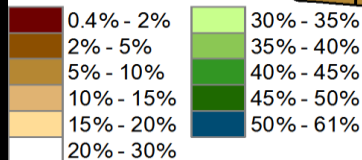
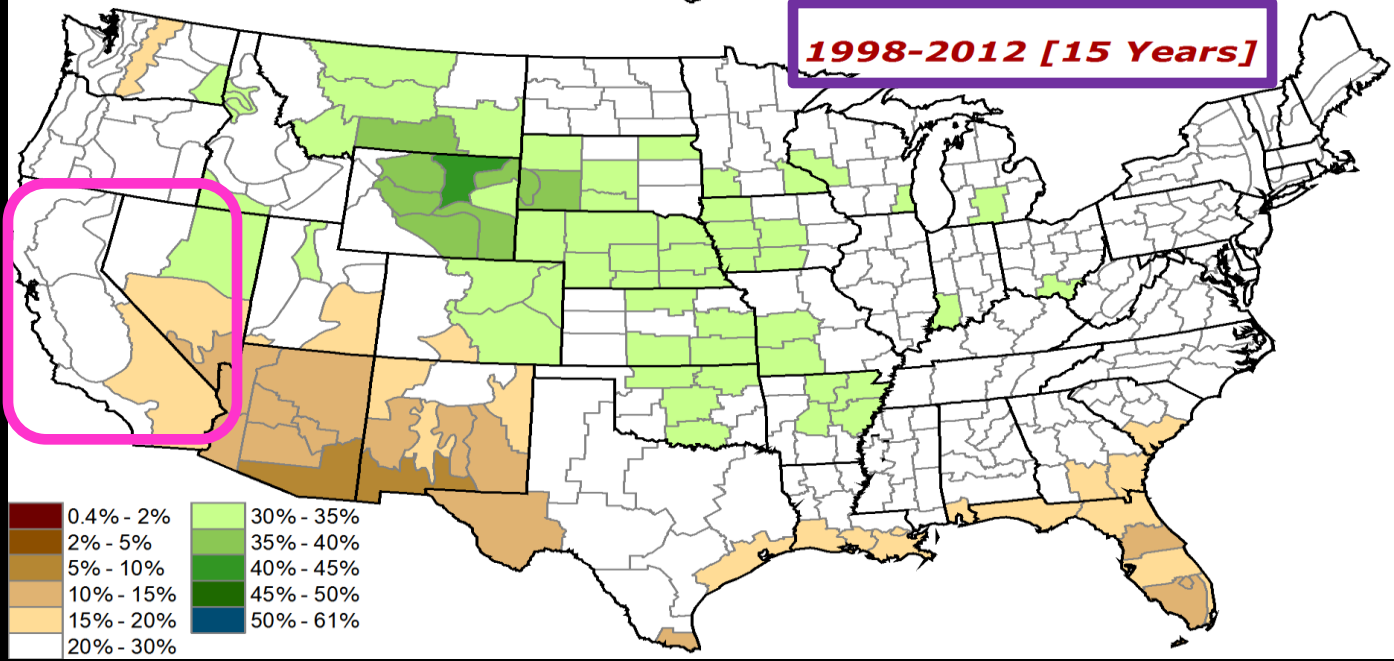
Median Percent of Annual Precipitation -- MAM

1931-2012 [82 Years]



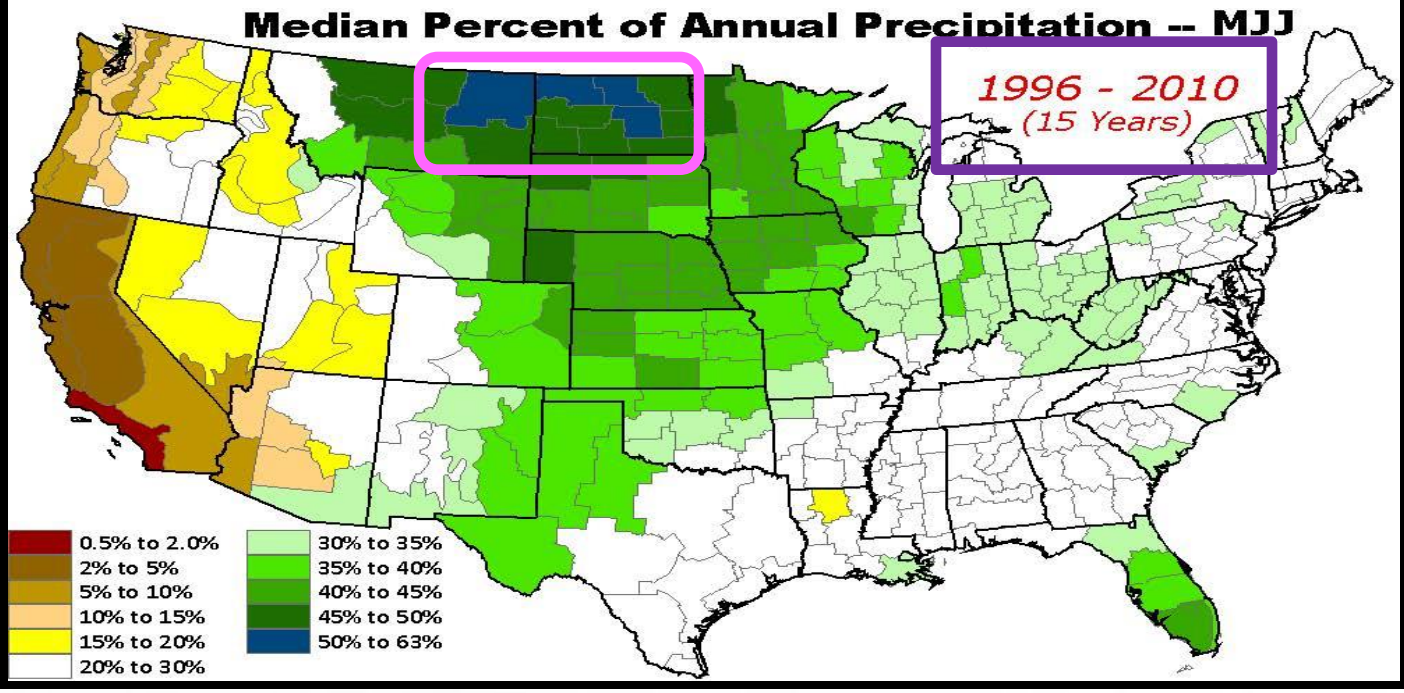
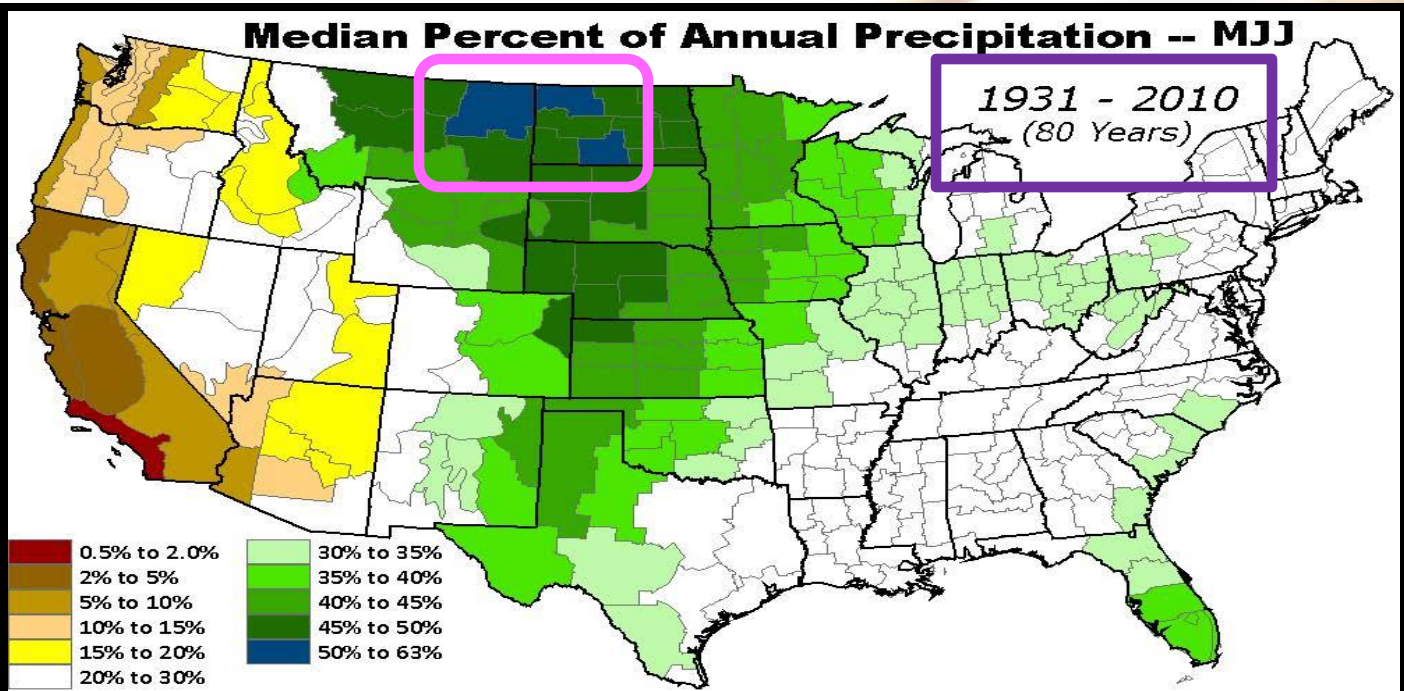
Period of Record (above)
& Short-Term Trend (below)

1998-2012 [15 Years]



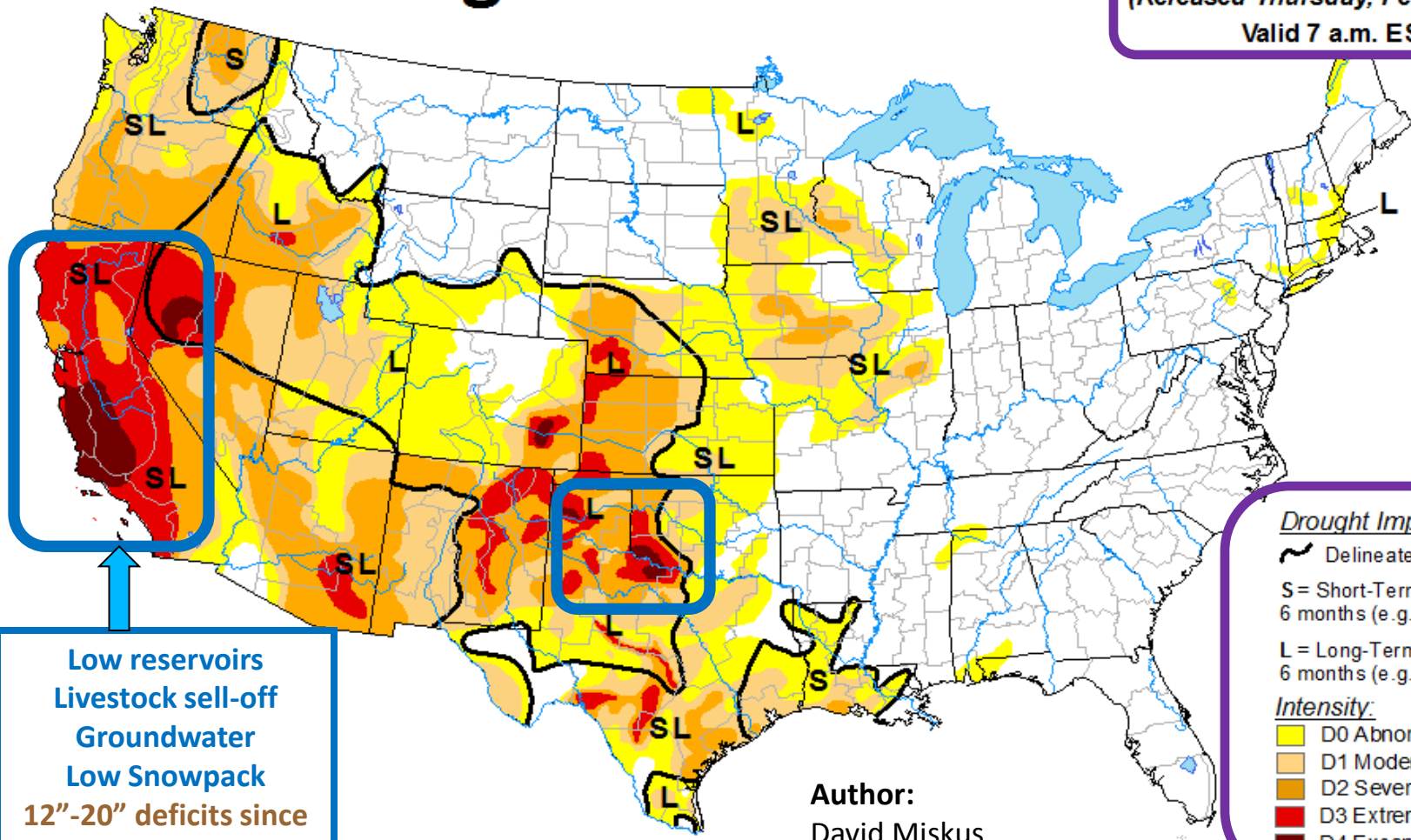
From **15%-30%**
of California's
annual
precipitation
comes in
Mar-Apr-May

From **35%-60%**
of Central U.S.'s
annual
precipitation
comes in
May-June-July
(MCS's/Fronts)



U.S. Drought Monitor

February 18, 2014
 (Released Thursday, Feb. 20, 2014)
 Valid 7 a.m. EST



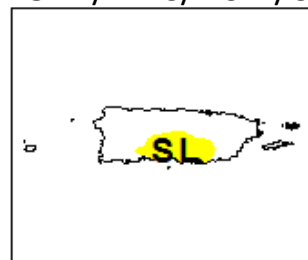
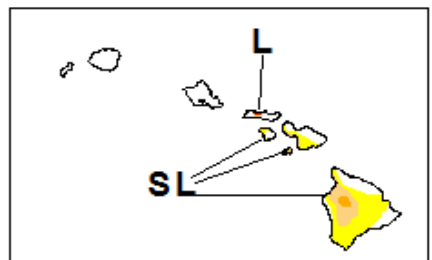
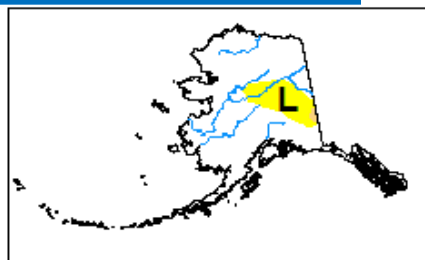
Low reservoirs
 Livestock sell-off
 Groundwater
 Low Snowpack
 12"-20" deficits since
 start of WY

Drought Impact Types:
 ~ Delineates dominant impacts
 S = Short-Term, typically less than 6 months (e.g. agriculture, grasslands)
 L = Long-Term, typically greater than 6 months (e.g. hydrology, ecology)

Intensity:
 Yellow: D0 Abnormally Dry
 Light Orange: D1 Moderate Drought
 Orange: D2 Severe Drought
 Red: D3 Extreme Drought
 Dark Red: D4 Exceptional Drought

Author:
 David Miskus
 NOAA/NWS/NCEP/CPC

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.



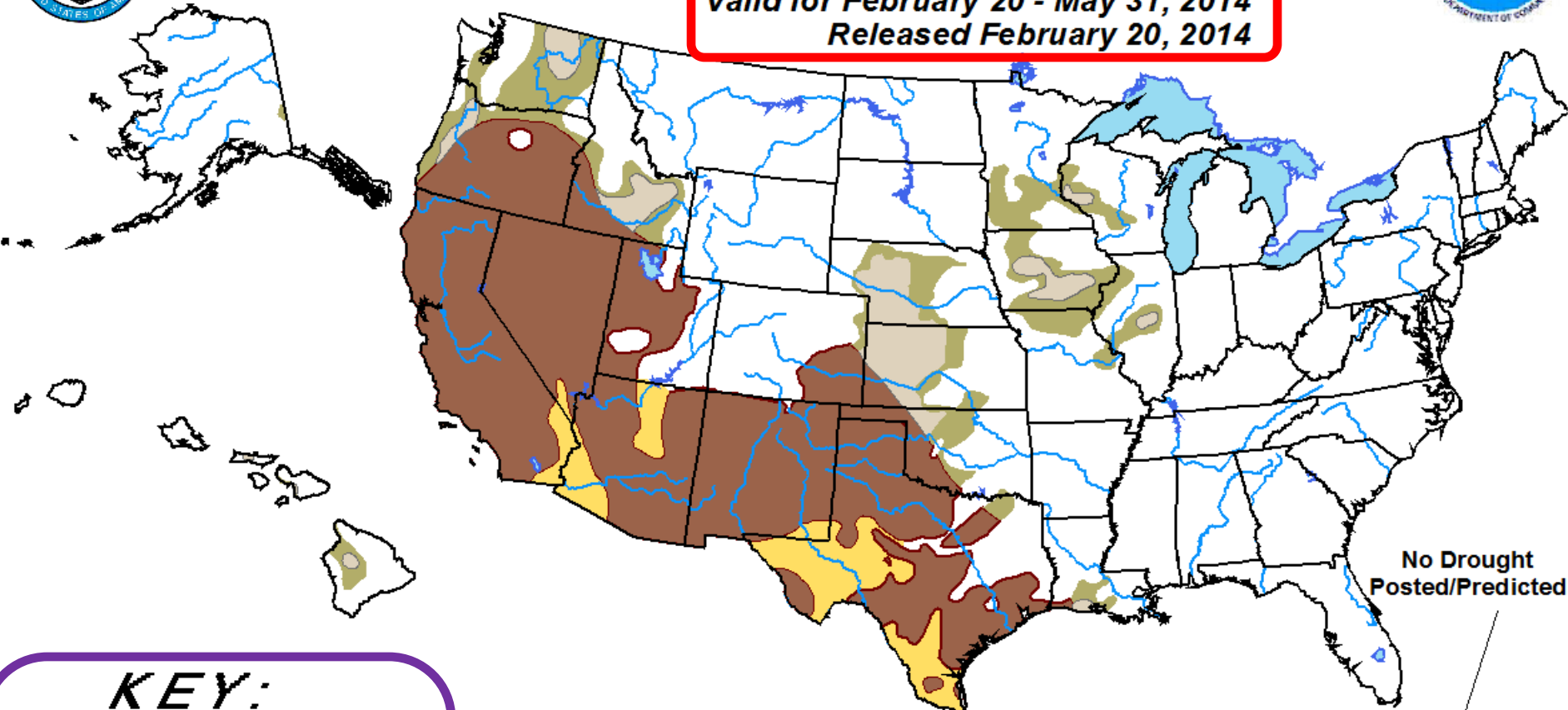
<http://droughtmonitor.unl.edu/>




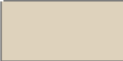


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for February 20 - May 31, 2014
Released February 20, 2014



KEY:

-  Drought persists or intensifies
-  Drought remains but improves
-  Drought removal likely
-  Drought development likely

Author: Adam Allgood, Climate Prediction Center, NOAA
http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.html

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor.
 NOTE: The tan area areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain. The Green areas imply drought removal by the end of the period (D0 or none)

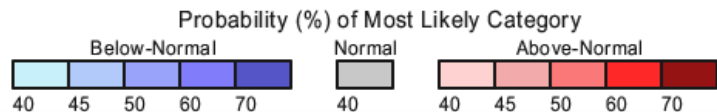
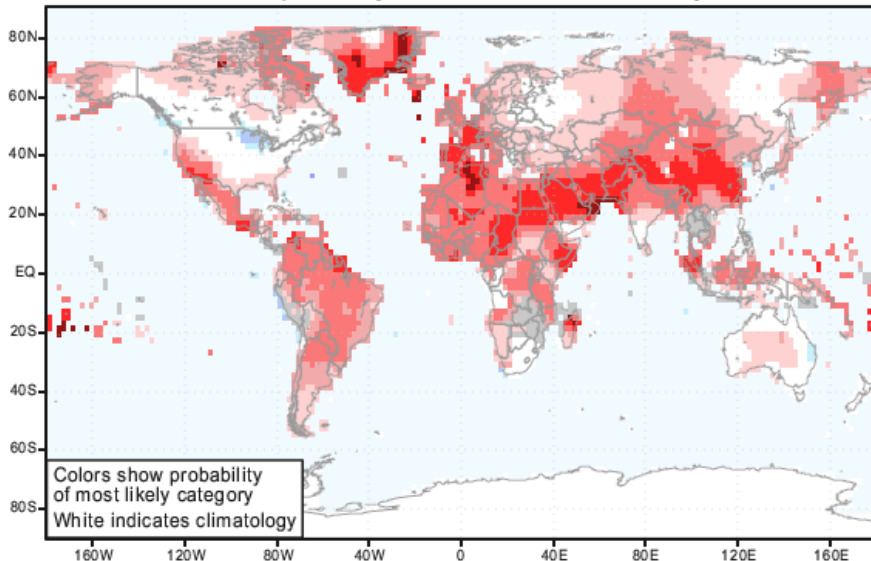
IRI* Multi-Model Forecast

SPRING

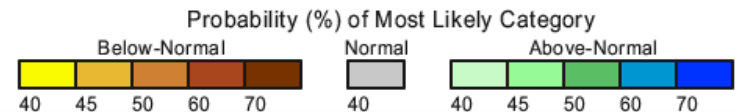
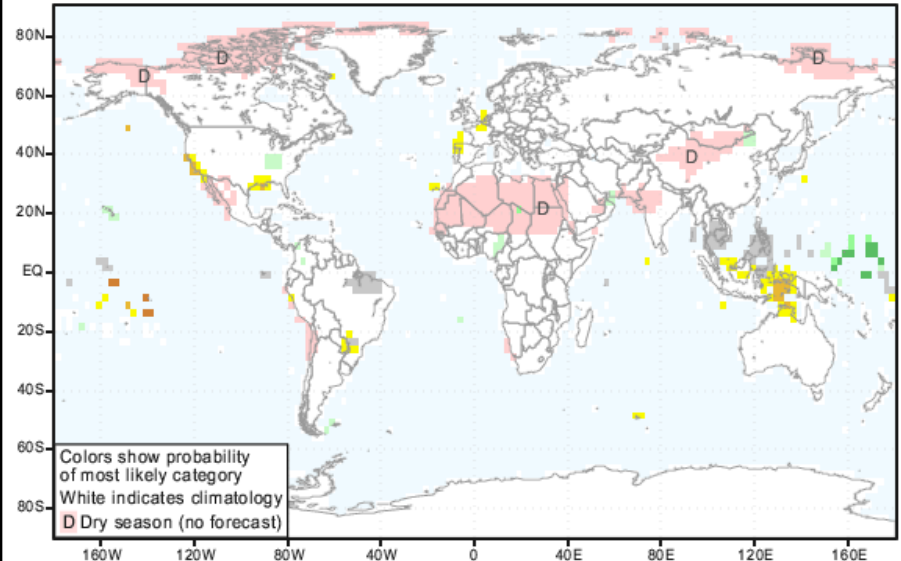
TEMPERATURE

PRECIPITATION

IRI Multi-Model Probability Forecast for Temperature for March-April-May 2014, Issued February 2014



IRI Multi-Model Probability Forecast for Precipitation for March-April-May 2014, Issued February 2014



* International Research Institute for Climate and Society
(Lamont Campus, Columbia University, Palisades, NY)

http://iri.columbia.edu/climate/forecast/net_asmt/2014/feb2014/images/MAM14_World_temp.gif

http://iri.columbia.edu/climate/forecast/net_asmt/2014/feb2014/images/MAM14_World_pcp.gif

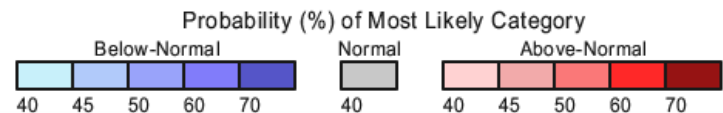
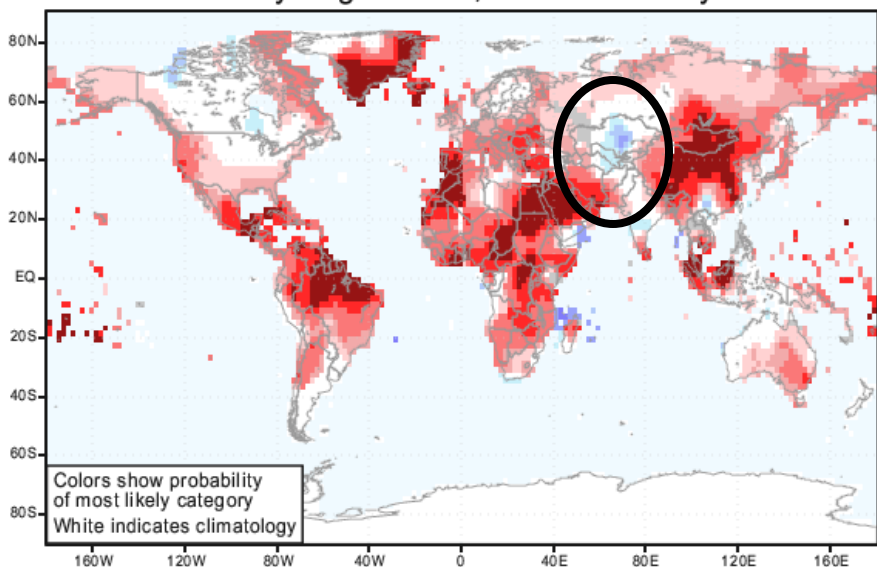
IRI* Multi-Model Forecast

SUMMER

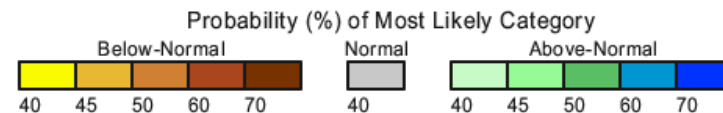
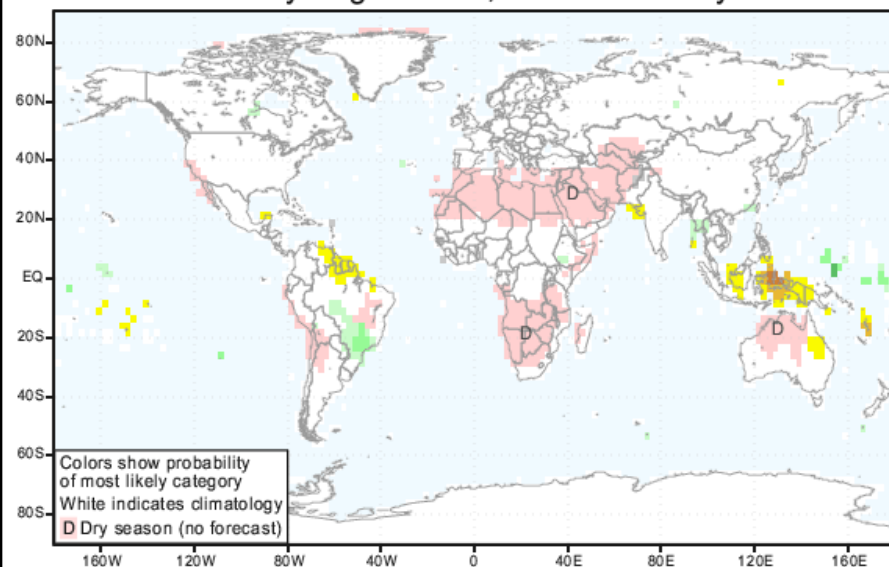
TEMPERATURE

PRECIPITATION

IRI Multi-Model Probability Forecast for Temperature for June-July-August 2014, Issued February 2014



IRI Multi-Model Probability Forecast for Precipitation for June-July-August 2014, Issued February 2014



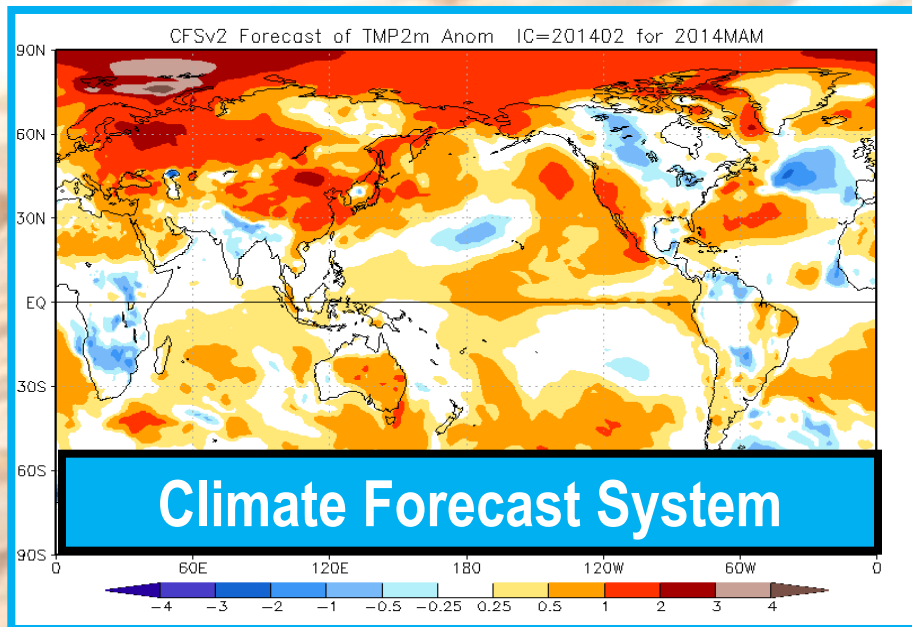
* International Research Institute for Climate and Society
(Lamont Campus, Columbia University, Palisades, NY)

http://iri.columbia.edu/climate/forecast/net_asmt/2014/feb2014/images/JJA14_World_temp.gif

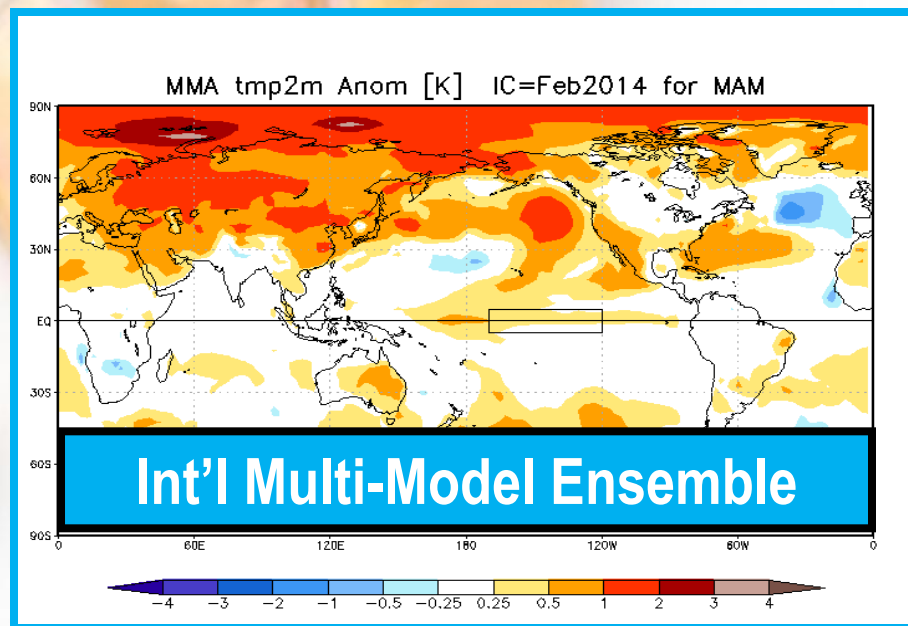
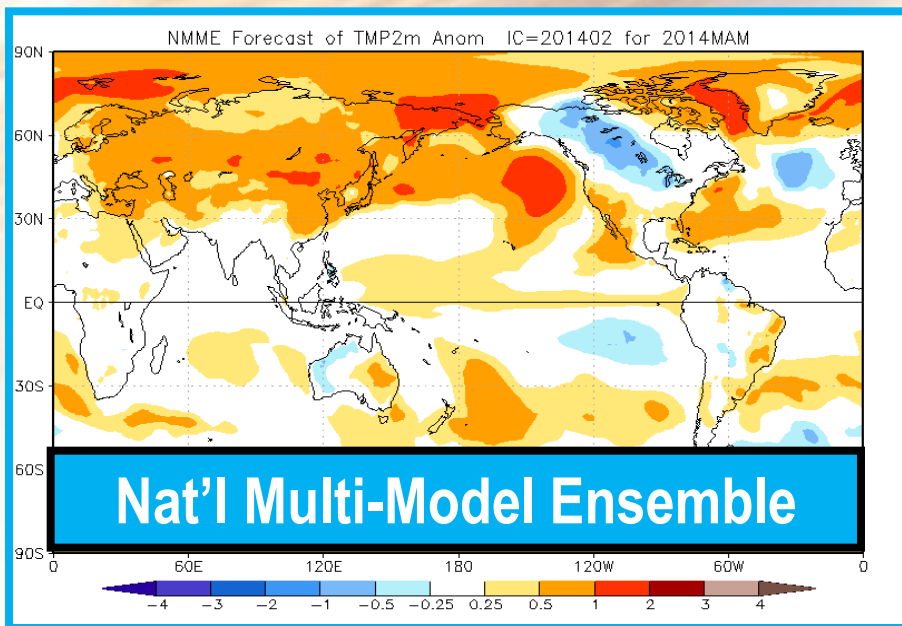
http://iri.columbia.edu/climate/forecast/net_asmt/2014/feb2014/images/JJA14_World_pcp.gif

International Temperature Outlooks for MAM 2014

SPRING

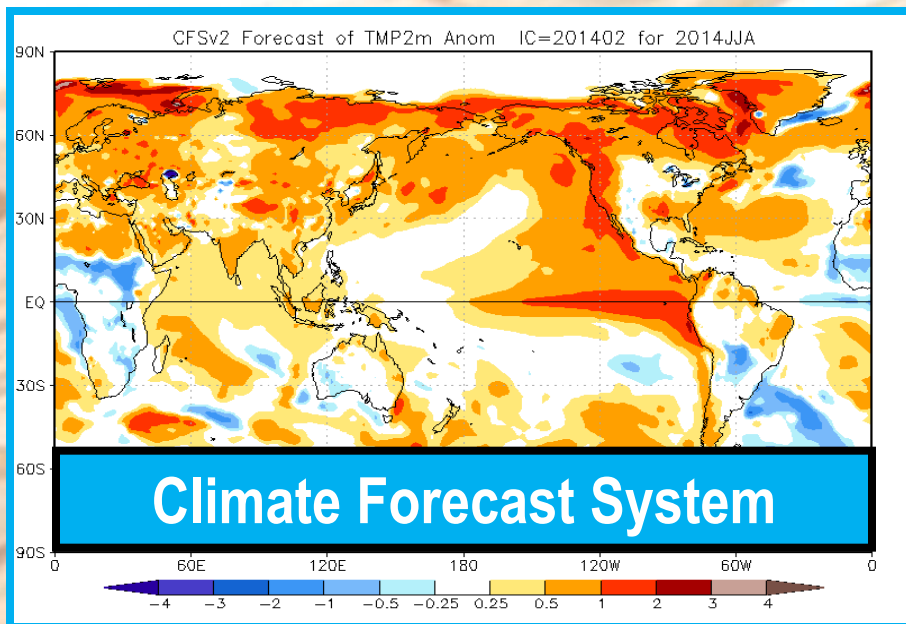


SPRING

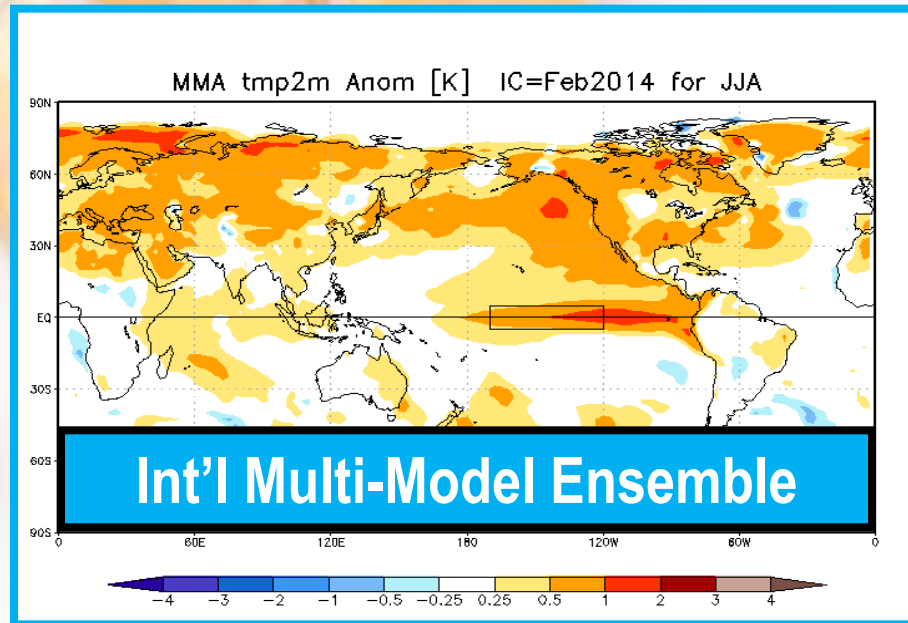
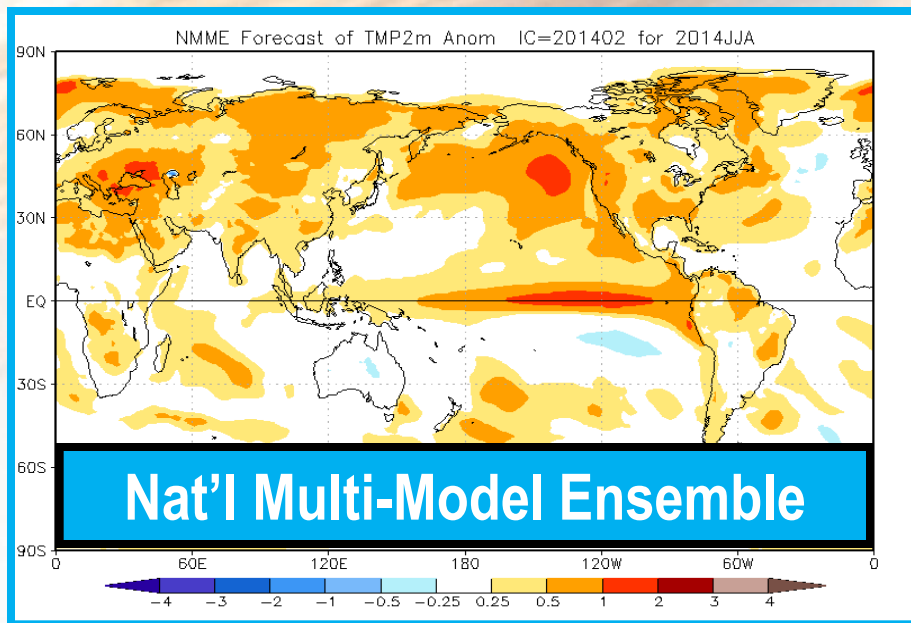


International Temperature Outlooks for JJA 2014

SUMMER

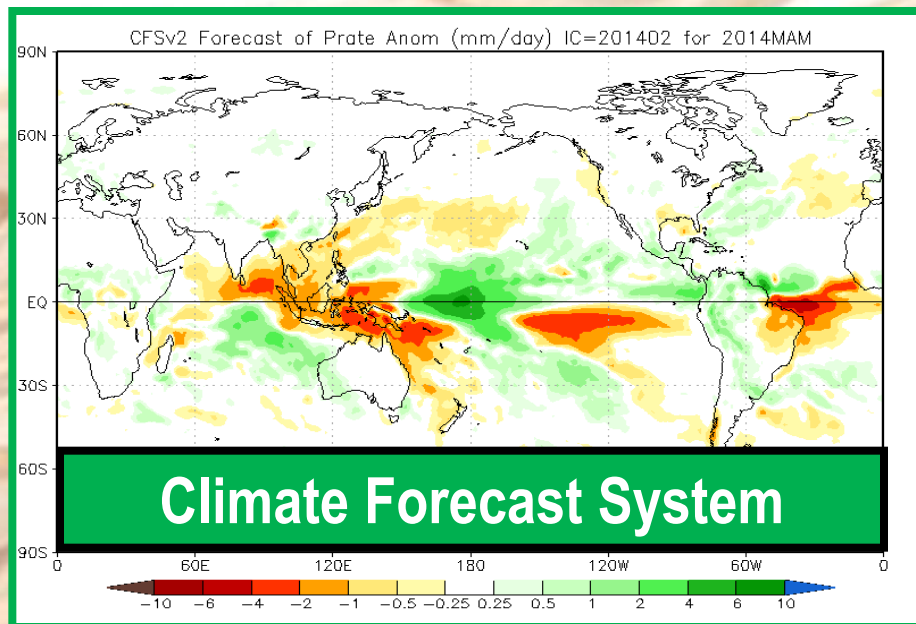


SUMMER

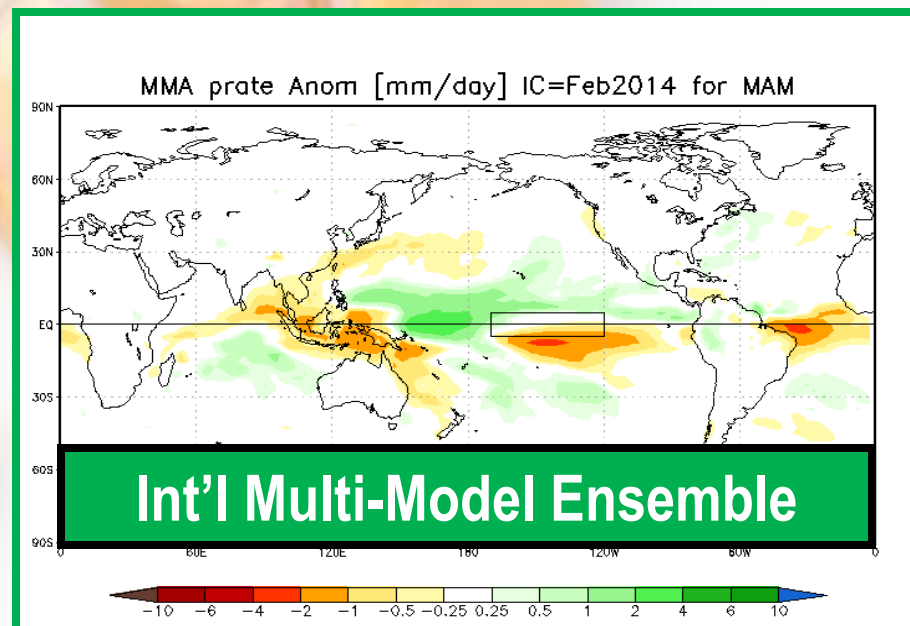
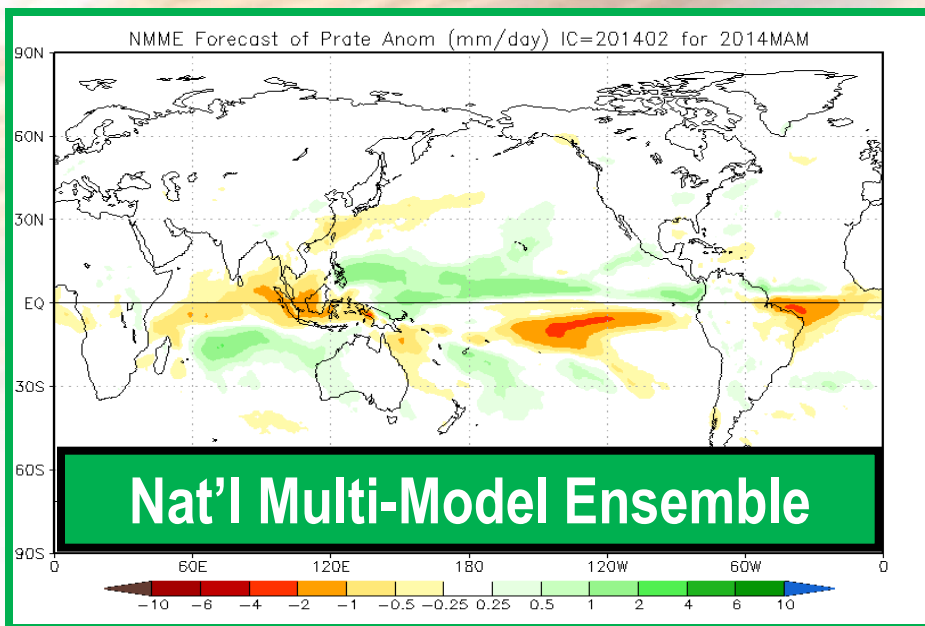


International Precipitation Outlooks for MAM 2014

SPRING



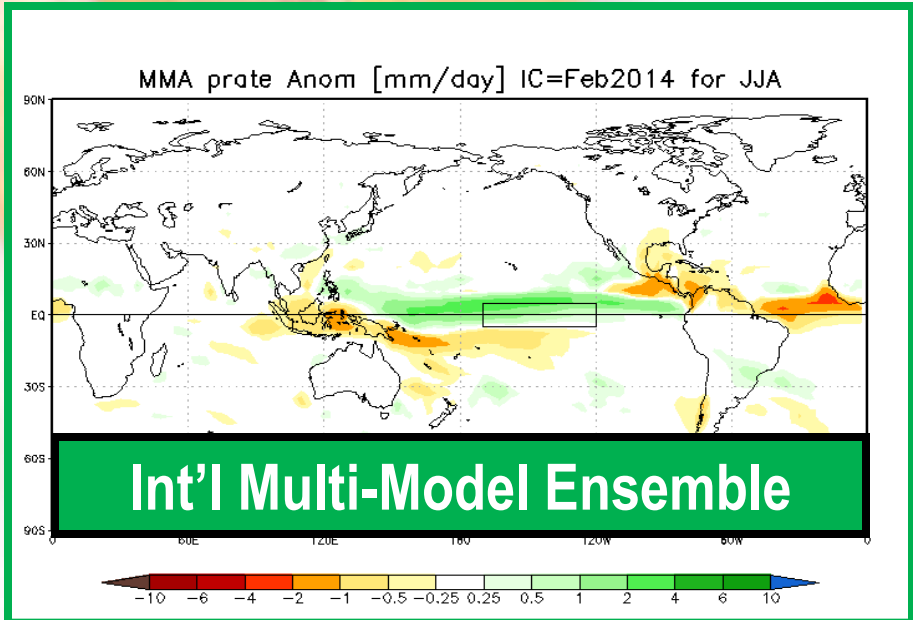
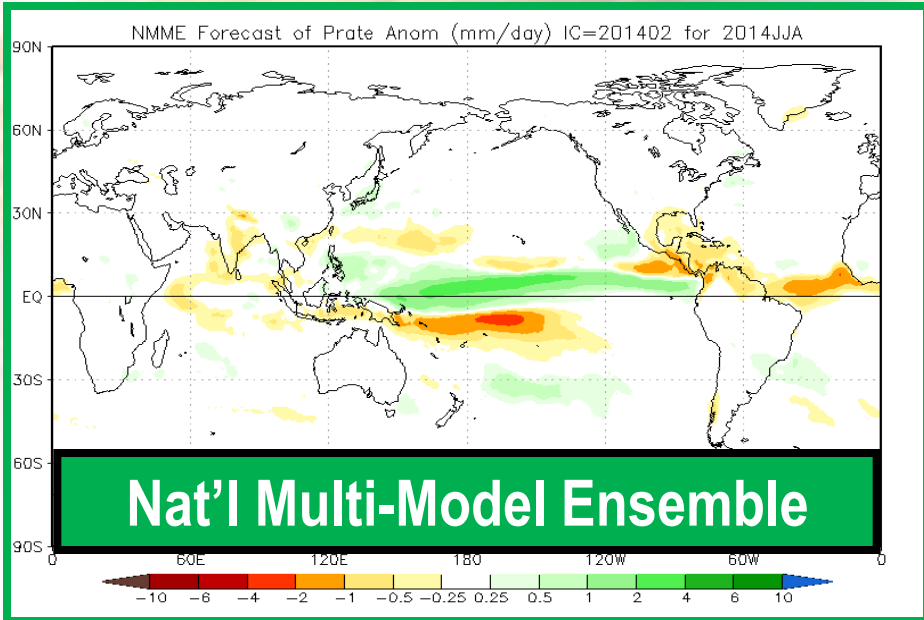
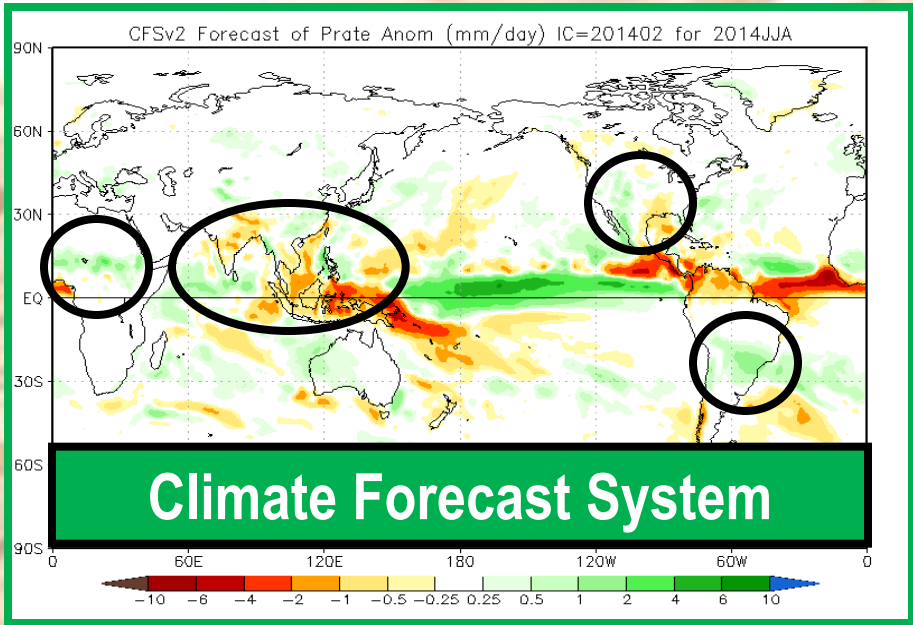
SPRING



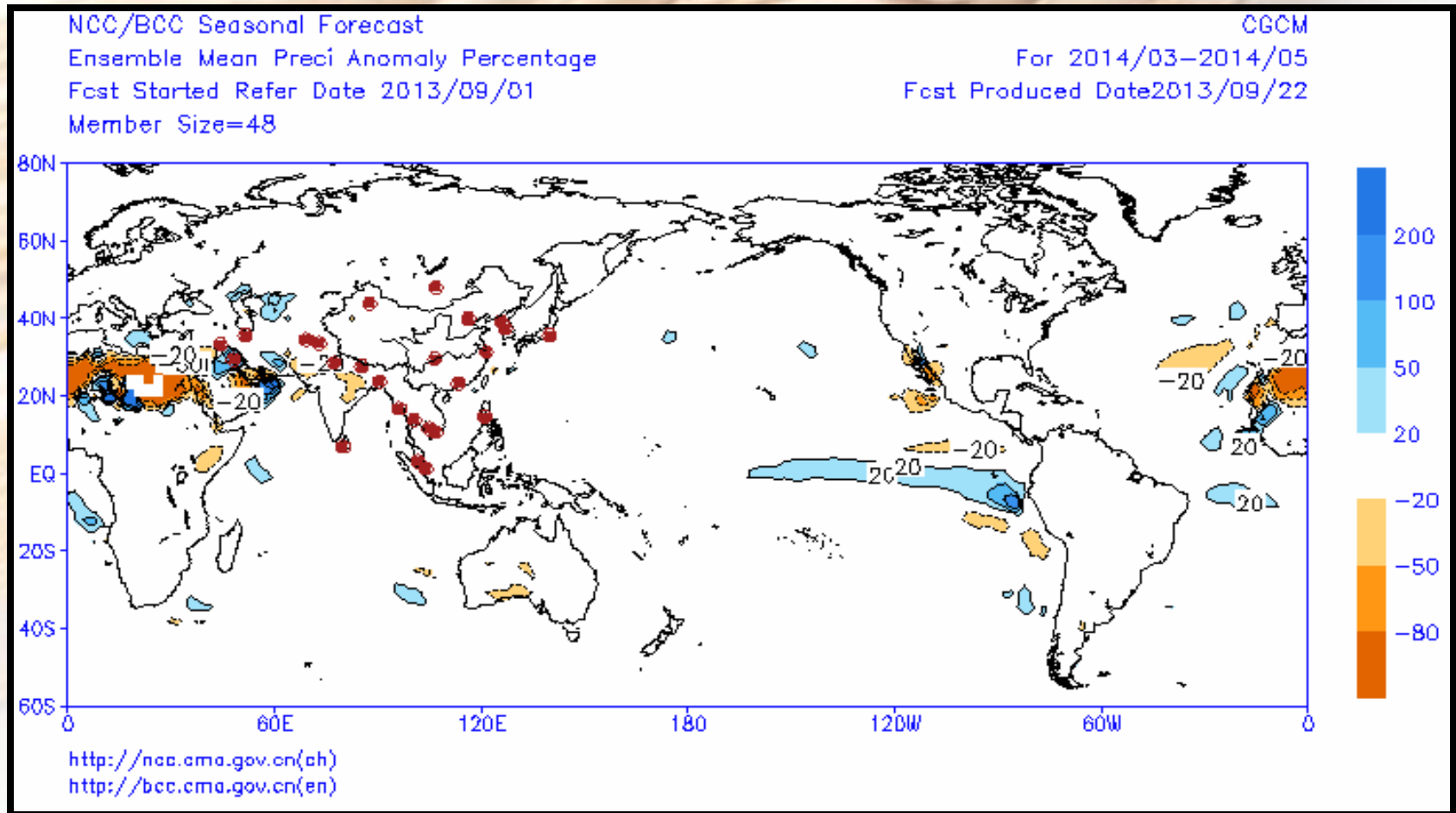
International Precipitation Outlooks for JJA 2014

SUMMER

SUMMER



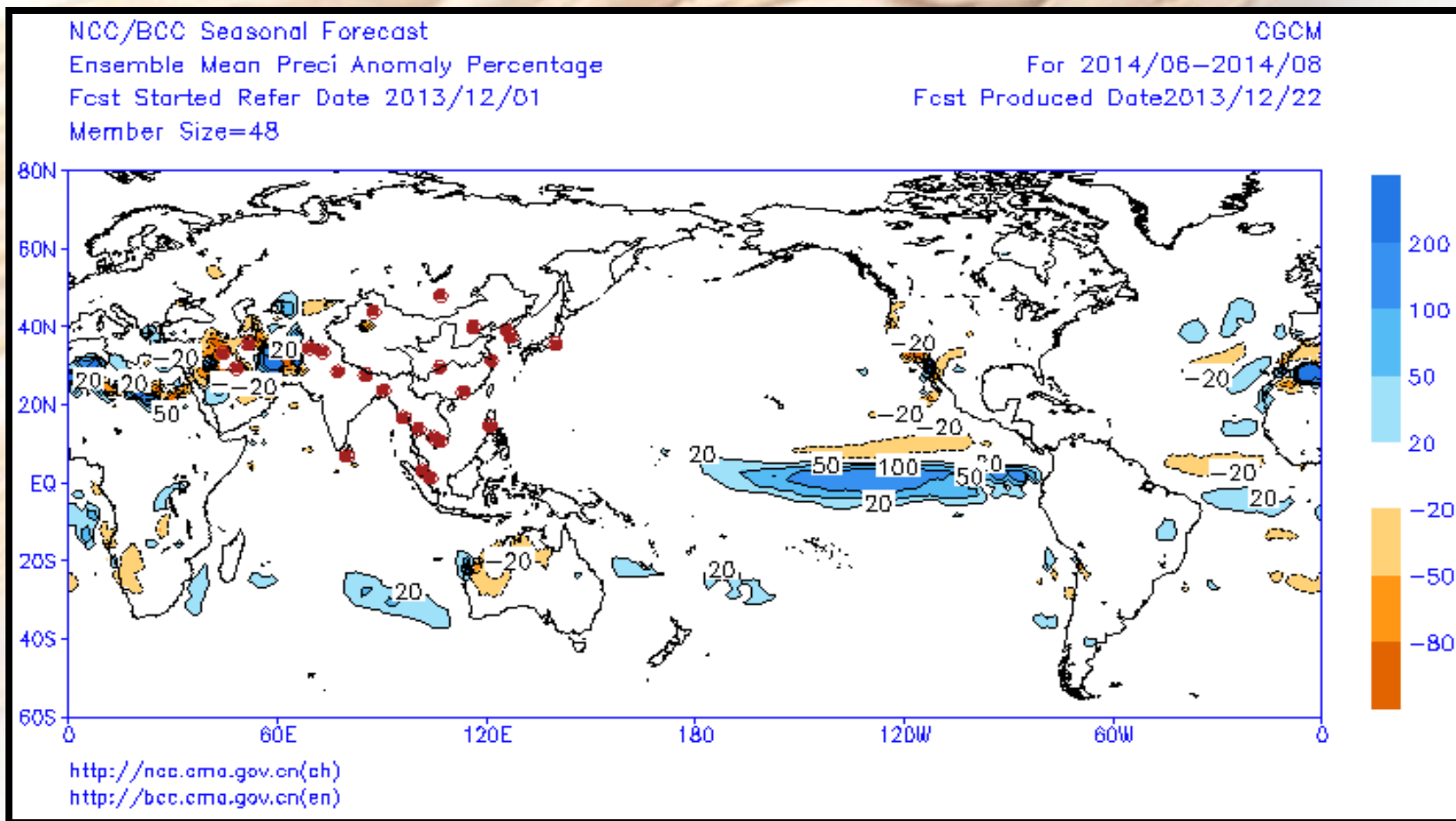
Beijing Climate Center (March-May 2014 Precipitation)



http://cmdp.ncc.cma.gov.cn/pred/cs/CS2014/CS201403_201405GLRAINL6.GIF

Beijing Climate Center

(June-August 2014 Precipitation)



http://cmdp.ncc.cma.gov.cn/pred/cs/CS2014/CS201406_201408GLRAINL6.GIF

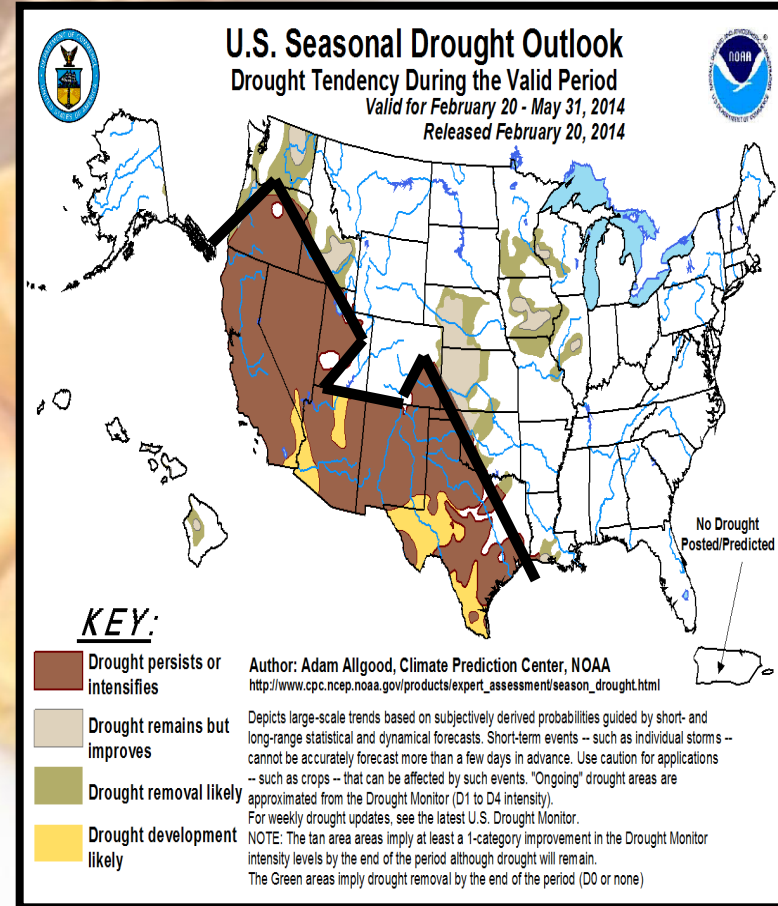
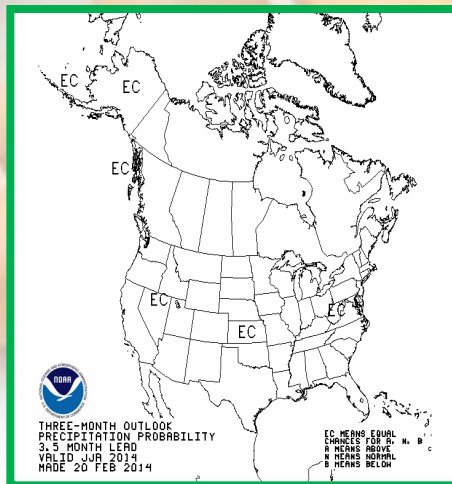
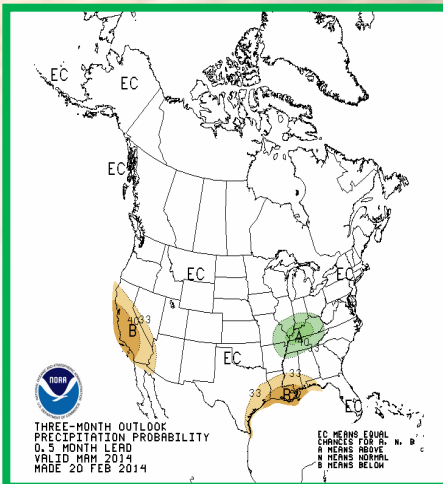
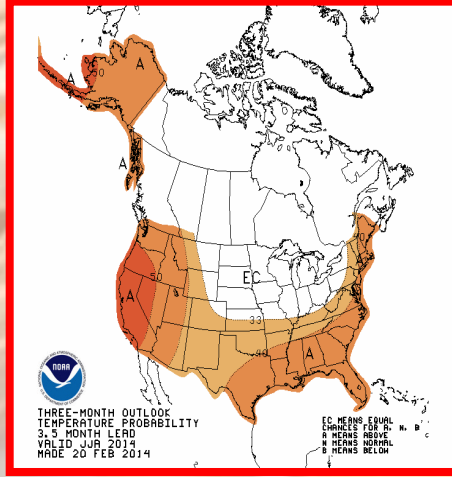
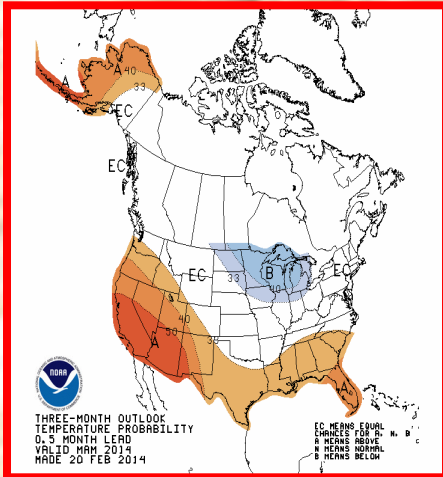
SUMMARY:

ENSO-NEUTRAL (Spring)

NEUTRAL/WARM (Summer)

SPRING

SUMMER



THE END



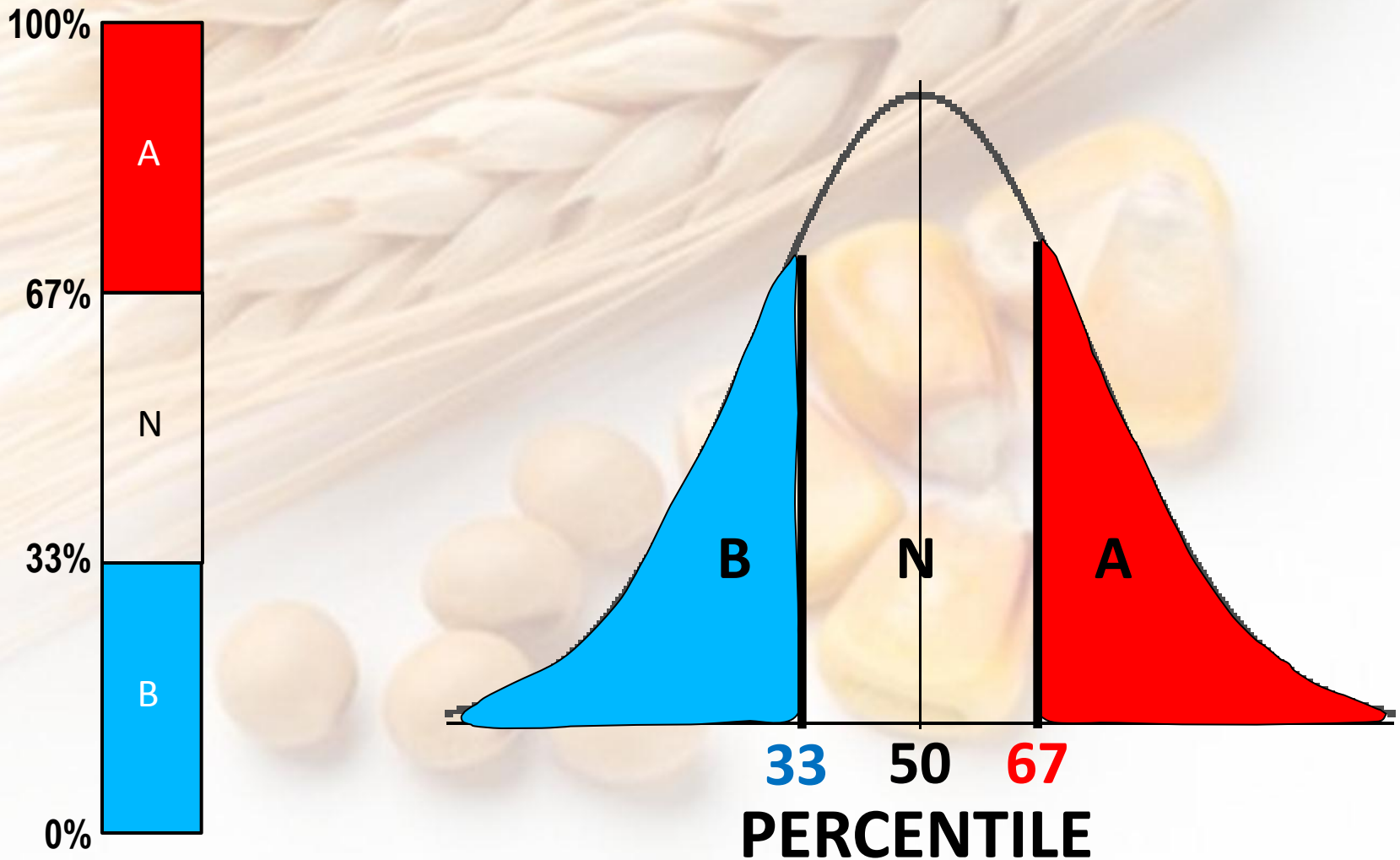
Pictures:

http://www.cameronhanover.com/wp-content/uploads/corn_wheat_soybeans1.jpg

http://nixahardware.com/images/alfalfa_hay_round_bales.jpg

<http://www.cottonman.com/images/cotton%20pictures/cotton%20field.jpg><http://www.techni-kboerse.com/pictures/49007145/5983b7c4-2de5-41bc-9d78-fc2e0b42c8c8.jpg> (axial flow combine)

CLIMATOLOGICAL CATEGORIES/TERCILES (1981-2010 Temp / Prcp Historical Observations)



Verification of several Climate Outlooks (2014)

Heidke Skill Score (HSS):

$$\text{HSS} = \frac{C - E}{T - E} \times (100)$$

C: number of stations **Correctly** forecast
E: number of stations **Expected** Correct by random chance (=1/3)
T: **Total** number of stations



“FLASH DROUGHT” OF 2012

Antecedent winter/spring soils insufficiently recharged

Very mild winter left little snowpack to help keep soils moist in spring

Record Heat in March coming out of a La Nina winter

Rapid Onset of Heat in early June 2012 (bad timing)

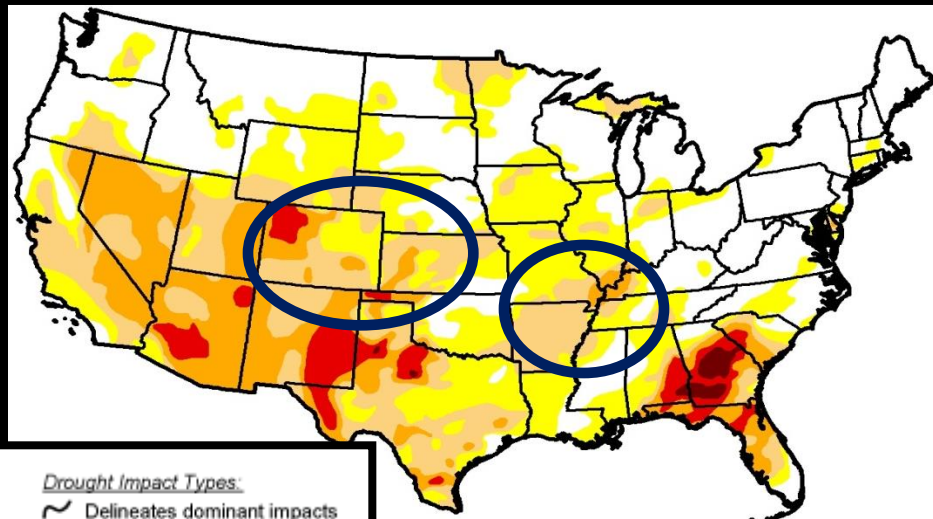
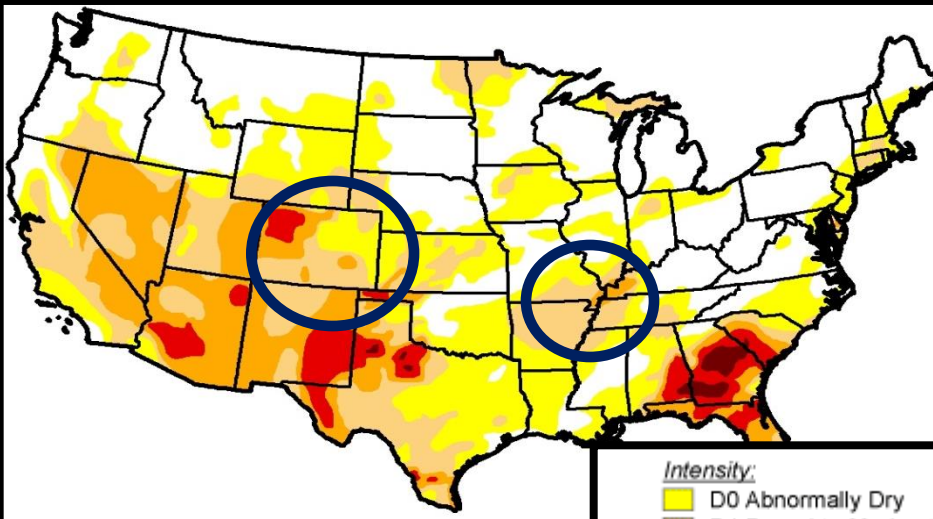


Pre-existing Drought rapidly intensifies & expands

(U.S. Drought Monitor 2012)

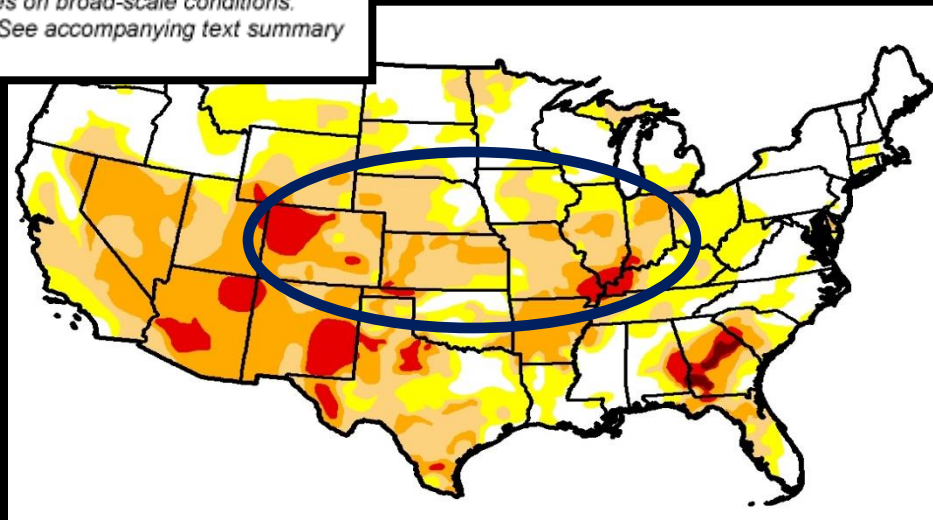
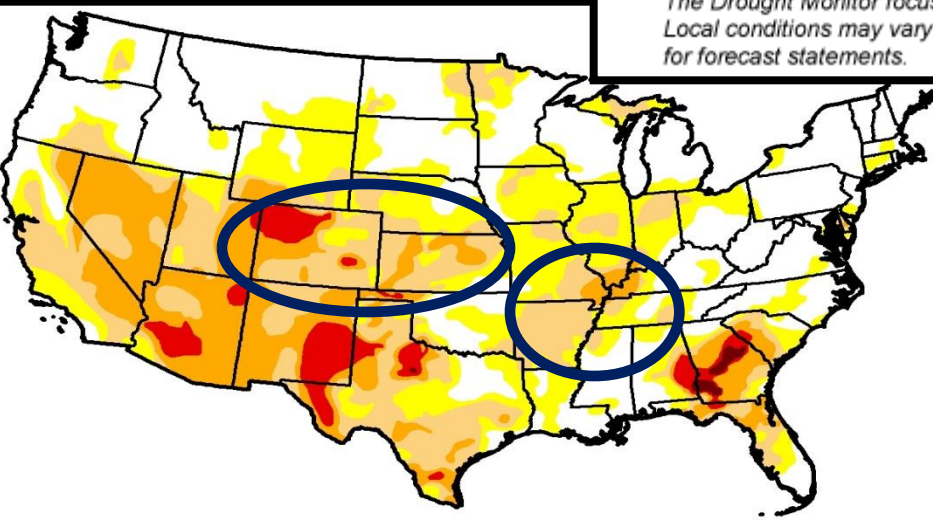
May 29

June 5



June 12

June 19



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- ~ Delineates dominant impacts
- S = Short-Term, typically <6 months (e.g. agriculture, grasslands)
- L = Long-Term, typically >6 months (e.g. hydrology, ecology)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.